AGRICULTURAL RESEARCH COUNCIL

Index of Agricultural Research 1957

CAMBRIDGE UNIVERSITY PRESS

12s. 6d. net

AGRICULTURAL RESEARCH COUNCIL

INDEX OF AGRICULTURAL RESEARCH 1957

INDEX OF AGRICULTURAL RESEARCH

1957

CAMBRIDGE
Published for the
AGRICULTURAL RESEARCH COUNCIL
AT THE UNIVERSITY PRESS
1957

PUBLISHED BY
THE SYNDICS OF THE CAMBRIDGE UNIVERSITY PRESS
Bentley House, 200 Euston Road, London, N.W. 1
American Branch: 32 East 57th Street, New York 22, N.Y.

Printed in Great Britain at the University Press, Cambridge
(Brooke Crutchley, University Printer)

CONTENTS

	Page
Introduction	vii
Key to abbreviated titles of Institutions	ix
SUBJECT INDEX	1
Soils	3
Fertilizers and Manures	8
Meteorology	12
Crop Husbandry and Horticulture	13
Plant Breeding and Genetics	15
Plant Physiology and Biochemistry	17
Microbiology	24
Plant Protection	27
A. Plant Diseases	27
B. Plant Pests	30
C. Insecticides and Fungicides	34
D. Weeds and Weedkillers	37
Bees	40
Plant Products	41
Grassland and Herbage	42
Animal Management and Husbandry and Housing	51
Animal Breeding and Genetics	57
Animal Physiology (including Nutrition)	63
Animal Pathology	79
Animal Products	97
Agricultural Engineering	101
Statistics	105
ANIMAL INDEX	109
CROP INDEX	135
APPENDIX. Agricultural Research Institutes which publish Annual Reports	189

INTRODUCTION

This is the third edition of the *Index of Agricultural Research in Progress*, first published in 1951. It includes the work of the following organizations: the Agricultural Research Institutes of Great Britain; the long-term investigations of the Experimental Husbandry Farms and Horticulture Stations; the National Agricultural Advisory Services in the provinces; the Scottish Agricultural Colleges; and the Ministry of Agriculture for Northern Ireland. It also includes the work of the Veterinary Laboratory, Weybridge and the Plant Pathology Laboratory, Harpenden, of the Ministry of Agriculture, Fisheries and Food, and of the National Institute of Agricultural Botany, Cambridge.

The *Index* therefore covers almost all State-aided agricultural research in the United Kingdom, whether it is financed by the Agricultural Research Council, the Ministry of Agriculture, Fisheries and Food, the Department of Agriculture for Scotland, or the Ministry of Agriculture for Northern Ireland. Not all the short-term experiments of the advisory services are listed, though some indication of their range is given. The *Index* does not include agricultural research in Universities, except when assisted by grants from the Council or the Government Agricultural Departments. A more complete list of the University work is available in *Scientific Research in British Universities 1956–57*, published by the Department of Scientific and Industrial Research.

Information is listed in two ways: first, in a classified Subject Index which brings together items in the same fields of enquiry; and secondly, in Animal and Crop Indexes which list researches directed towards improved production in particular types of farm livestock and crops.

The arrangement of the Subject Index has been changed: it now conforms with the general recommendations of the Food and Agriculture Organization of the United Nations, which has asked all member countries in Europe to prepare similar registers of their agricultural research. The British *Index*, though compiled primarily for the use of British research workers, will be more convenient for the international exchange of information in its new form.

In successive editions of the *Index*, subdivisions under the main headings have been made fewer and more inclusive, while to save repetition more cross-references have been inserted. This has achieved economies in space without the sacrifice of too much detail; but the user may have to look in more than one place to obtain all the available information.

Entries have been taken from the programmes of the organizations concerned; but the length of an entry is no indication of the research effort represented, or of the number of workers engaged. Some projects, which are studied intermittently, have been included to make the list comprehensive. New projects for which no starting date has been fixed have been omitted.

Details of the organization and administration of agricultural research in Great Britain will be found in the companion booklet *The Agricultural Research Service*.

KEY TO ABBREVIATED TITLES OF INSTITUTIONS

A.B.R.O.	A.R.C. Animal Breeding Research Organization, 'Glenbourne', South Oswald Road, Edinburgh 9. *Director:* H. P. DONALD, D.SC., PH.D., F.R.S.E.
Babraham	A.R.C. Institute of Animal Physiology, Babraham Hall, Babraham, Cambridge. *Director:* I. DE BURGH DALY, M.A., M.D., F.R.C.P., F.R.S.
Carlisle	Ministry of Agriculture, Fisheries and Food Field Research Laboratory, Blackford, Carlisle. *Director:* A. W. STABLEFORTH, D.SC., M.R.C.V.S., D.V.S.M.
Compton	A.R.C. Field Station, Compton, Newbury, Berks. *Director:* W. S. GORDON, C.B.E., PH.D., M.R.C.V.S., F.R.S.E.
E. Malling	East Malling Research Station, Maidstone, Kent. *Director:* F. R. TUBBS, M.SC., PH.D., A.R.C.S., D.I.C., F.L.S.
E.R.A.	Electrical Research Association (The British Electrical & Allied Industries Research Association), Thorncroft Manor, Dorking Road, Leatherhead, Surrey.
E. Scot. Coll.	Edinburgh and East of Scotland College of Agriculture, 13 George Square, Edinburgh 8. *Principal:* PROFESSOR S. J. WATSON, D.SC., F.R.I.C., F.R.S.E.
Exptl. Hort. Stn.	National Agricultural Advisory Service Experimental Horticulture Stations.
Efford	Lymington, Hants.
Fairfield	Kirkham, Lancs.
Luddington	Luddington, Stratford-on-Avon.
Rosewarne	Camborne, Cornwall.
Stockbridge House	Cawood, Selby, Yorks.
Exptl. Husb. Farm	National Agricultural Advisory Service Experimental Husbandry Farms.
Boxworth	Boxworth, Cambridge.
Bridget's	Martyr Worthy, Winchester, Hants.
Drayton	Alcester Road, Stratford-on-Avon.
Gleadthorpe	Welbeck Colliery Village, Mansfield, Notts.
Great House	Helmshore, Rossendale, Lancs.
High Mowthorpe	Duggleby, Malton, E. Yorks.
Kirton	Kirton, Boston, Lincs.
Liscombe	Dulverton, Somerset.
Pwllpeiran	Cwmystwyth, Aberystwyth.

Rosemaund	Preston Wynne, Hereford.
Terrington	Terrington St Clement, King's Lynn, Norfolk.
Trawscoed	Trawscoed, Aberystwyth.
Glasshouse Crops	Glasshouse Crops Research Institute, Worthing Road, Rustington, Littlehampton, Sussex. *Director:* F. W. TOOVEY, O.B.E., B.SC., A.R.C.S.
Grassland R.S.	Grassland Research Station, Hurley, Maidenhead, Berks. *Director:* WILLIAM DAVIES, D.SC.
Hannah	Hannah Dairy Research Institute, Kirkhill, Ayr. *Director:* J. A. B. SMITH, D.SC., PH.D., F.R.S.E.
Harper Adams	Harper Adams Agricultural College, Newport, Shropshire. *Principal:* W. T. PRICE, M.C., B.SC., A.R.I.C.S., N.D.A., N.D.D.
Hill Farm R.O.	Hill Farming Research Organization, 48 Palmerston Place, Edinburgh 12. *Director:* A. R. WANNOP, O.B.E., B.AGRIC., B.ENG., F.R.S.E.
Houghton	Houghton Poultry Research Station, Houghton, Huntingdon. *Director:* R. F. GORDON, D.SC., M.R.C.V.S.
John Innes	John Innes Horticultural Institution, Bayfordbury, Hertford. *Director:* K. S. DODDS, D.SC., PH.D.
Lasswade	Ministry of Agriculture, Fisheries and Food Poultry Laboratory, Eskgrove, Lasswade, Midlothian. *In charge:* J. E. WILSON, B.SC., M.R.C.V.S., F.R.S.E.
Lister Inst.	Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W.1. *Director:* PROFESSOR A. A. MILES, C.B.E., M.D., F.R.C.P.
Long Ashton	Agricultural and Horticultural Research Station, Long Ashton, Bristol. *Director:* PROFESSOR T. WALLACE, C.B.E., M.C., D.SC., F.R.I.C., V.M.H., F.R.S.
Macaulay	Macaulay Institute for Soil Research, Craigiebuckler, Aberdeen. *Director:* D. N. MCARTHUR, C.B.E., D.SC., PH.D., F.R.I.C., F.R.S.E.
M.A.F.F. Infest. Control	Ministry of Agriculture, Fisheries and Food, Infestation Control Division, Hook Rise, Tolworth, Surbiton, Surrey. *In charge of research:* I. THOMAS, M.SC., PH.D.
Moredun	Animal Diseases Research Association, Moredun Institute, Edinburgh 9. *Director:* J. T. STAMP, D.SC., M.R.C.V.S., F.R.S.E.

Key to Abbreviated Titles of Institutions

N.A.A.S.	National Agricultural Advisory Service (Ministry of Agriculture, Fisheries and Food). Headquarters: Great Westminster House, Horseferry Road, London, S.W.1. *Director:* R. RAE, C.B., B.AGRIC.
Provinces:	Provincial Centres:
Eastern	Anstey Hall, Trumpington, Cambridge.
East Midland	Block 2, Government Buildings, Chalfont Drive, Nottingham.
Northern	Government Buildings, Kenton Bar, Newcastle upon Tyne.
South Eastern	Government Buildings, Coley Park, Reading, Berks.
South Western	Government Buildings, Burghill Road, Westbury-on-Trym, Bristol.
West Midland	'Woodthorne', Wolverhampton, Staffs.
Yorks. and Lancs.	Government Buildings, Lawnswood, Leeds 6.
Wales	Caerlon, 8 Victoria Terrace, Aberystwyth, Cardiganshire. *see also:* Experimental Horticulture Stations and Husbandry Farms, *above*.
National Fruit Trials	Ministry of Agriculture, Fisheries and Food National Fruit Variety Trials scheme, *at* National Fruit Variety Testing Station, Brogdale Farm, Faversham, Kent, Royal Horticultural Society Gardens, Wisley, Surrey, and other centres. *Director:* J. M. S. POTTER, N.D.H.
N.I.A.B.	National Institute of Agricultural Botany, Huntingdon Road, Cambridge. *Director:* F. R. HORNE, M.A., N.D.A., N.D.D.
N.I.A.E.	National Institute of Agricultural Engineering, Wrest Park, Silsoe, Beds. *Director:* W. H. CASHMORE, C.B.E., B.A., N.D.A.
N.I.A.E. (Scot.)	National Institute of Agricultural Engineering Scottish Station, Howden, Mid-Calder, Midlothian. *Director:* W. J. WEST, B.A., DIP.AGRIC.
N.I.R.D.	National Institute for Research in Dairying, Shinfield, Reading, Berks. *Director:* PROFESSOR H. D. KAY, C.B.E., D.SC., PH.D., F.R.S.
N. Ireland	Ministry of Agriculture, Stormont, Belfast.
Norfolk	Norfolk Agricultural Station, Sprowston, Norwich, Norfolk. *Director:* F. RAYNS, C.B.E., M.A.
N. Scot. Coll.	North of Scotland College of Agriculture, 41½ Union Street, Aberdeen. *Principal:* M. A. H. TINCKER, M.A., D.SC., F.L.S.

N.V.R.S.	National Vegetable Research Station, Wellesbourne Warwick. *Director:* JAMES PHILP, B.SC., PH.D., F.L.S.
Pirbright	Research Institute (Animal Virus Diseases), Pirbright, Surrey. *Director:* I. A. GALLOWAY, D.SC., M.R.C.V.S.
Pl. Br. Inst.	Plant Breeding Institute, Maris Lane, Trumpington, Cambridge. *Director:* G. D. H. BELL, PH.D.
Pl. Path. Lab.	Ministry of Agriculture, Fisheries and Food Plant Pathology Laboratory, Milton Road, Harpenden, Herts. *Director:* W. C. MOORE, C.B.E., M.A.
Pl. Reg. Stn.	Department of Agriculture for Scotland Scientific Services Station, East Craigs, Corstorphine, Edinburgh. *Director:* T. P. MCINTOSH, O.B.E., B.SC., PH.D.
Poultry R.C.	A.R.C. Poultry Research Centre, King's Buildings, West Mains Road, Edinburgh 9. *Director;* A. W. GREENWOOD, C.B.E., D.SC., PH.D., F.R.S.E.
Res. Inst. Pl. Phys.	Research Institute of Plant Physiology, Imperial College of Science and Technology, South Kensington, London, S.W.7. *Director:* PROFESSOR F. G. GREGORY, D.SC., A.R.C.S., D.I.C., F.R.S.
Rothamsted	Rothamsted Experimental Station, Harpenden, Herts. *Director:* SIR WILLIAM G. OGG, M.A., PH.D., LL.D., F.R.S.E.
Rowett	Rowett Research Institute, Bucksburn, Aberdeen. *Director:* D. P. CUTHBERTSON, C.B.E., M.D., D.SC., F.R.S.E.
Scot. Hort. R.I.	Scottish Horticultural Research Institute, Mylnefield, Invergowrie, Dundee. *Director:* T. SWARBRICK, M.SC., PH.D.
Scot. P.B.S.	Scottish Plant Breeding Station, Pentlandfield, Roslin, Midlothian. *Director:* J. W. GREGOR, D.SC., PH.D., F.L.S.
Unit Biomet. Gen.	A.R.C. Unit of Biometrical Genetics, Department of Genetics, University of Birmingham. *Hon. Director:* PROFESSOR K. MATHER, C.B.E., D.SC., PH.D., F.R.S.
Unit Cell Phys.	A.R.C. Unit of Plant Cell Physiology, Department of Agriculture, University of Oxford. *Director:* R. BROWN, D.SC., PH.D., F.R.S.

Unit Embry.	A.R.C. Unit of Embryology, University College of North Wales, Bangor, Caerns. *Hon. Director:* PROFESSOR F. W. ROGERS BRAMBELL, B.A., D.SC., F.R.S.
Unit Exptl. Agron.	A.R.C. Unit of Experimental Agronomy, Department of Agriculture, University of Oxford. *Hon. Director:* PROFESSOR G. E. BLACKMAN, M.A.
Unit Insect Phys.	A.R.C. Unit of Insect Physiology, Department of Zoology, Downing Street, Cambridge. *Director:* PROFESSOR V. B. WIGGLESWORTH, C.B.E., M.A., M.D., B.CHIR., F.R.S.
Unit Microb.	A.R.C. Unit of Microbiology, Department of Microbiology, University of Sheffield. *Hon. Director:* S. R. ELSDEN, B.A., PH.D.
Unit Pl. Nutr.	A.R.C. Unit of Plant Nutrition (Micro-nutrients), Agricultural and Horticultural Research Station, Long Ashton, Bristol. *Hon. Director:* PROFESSOR T. WALLACE, C.B.E., M.C., D.SC., F.R.I.C., V.M.H., F.R.S.
Unit Repr. Phys.	A.R.C. Unit of Reproductive Physiology and Biochemistry, Molteno Institute, Downing Street, Cambridge. *Director:* T. R. R. MANN, M.D., SC.D., PH.D., F.R.S.
Unit Soil Physics	A.R.C. Unit of Soil Physics, School of Agriculture, Cambridge. *Director:* E. C. CHILDS, SC.D., PH.D.
Unit Stat.	A.R.C. Unit of Statistics, University of Aberdeen, Meston Walk, Aberdeen. *Director:* D. J. FINNEY, M.A., SC.D., F.R.S., F.R.S.E.
Unit Syst. Fung.	A.R.C. Unit on Plant Growth Substances and Systemic Fungicides, Wye College, Ashford, Kent. *Hon. Director:* PROFESSOR R. L. WAIN, D.SC., PH.D., F.R.I.C.
Unit Virus Res.	A.R.C. Virus Research Unit, Molteno Institute, Downing Street, Cambridge. *Director:* K. M. SMITH, C.B.E., D.SC., PH.D., F.R.S.
V. I. Centre	Ministry of Agriculture, Fisheries and Food Veterinary Investigation Centre.
V. I. Service	Ministry of Agriculture, Fisheries and Food Veterinary Investigation Service.
Welsh P.B.S.	Welsh Plant Breeding Station, Plas Gogerddan, Aberystwyth. *Director:* PROFESSOR E. T. JONES, M.SC., N.D.A., N.D.D.
Weybridge	Ministry of Agriculture, Fisheries and Food Veterinary Laboratory, New Haw, Weybridge, Surrey. *Director:* A. W. STABLEFORTH, D.SC., M.R.C.V.S., D.V.S.M.

W. Scot. Coll. — West of Scotland Agricultural College, 6 Blythswood Square, Glasgow, C.2.
Principal: DONALD S. HENDRIE, B.SC., N.D.A., N.D.D., DIP.AGRIC.

(Special Research Grants by the Agricultural Research Council are indicated by the letters R.G. following the entry and Block Grants, usually of five years' duration, by the letters B.G.)

(A.R.C. Junior Research Fellows and Veterinary Research Fellows are indicated by the letters J.R.F. or V.R.F. following the entry.)

SUBJECT INDEX

SOILS

Investigations closely related to those in this section are indexed under Fertilizers and Manures, Crop Husbandry, Plant Physiology, Microbiology and Grassland.

Chemistry

see Mineral Elements in Soils, *below*; Organic Matter, *below*; Physics and Physical Chemistry, *below*; Spectrochemical Analysis, *below*; Fertilizers and Manures, *page* 8

Clay Minerals

see Pedology, *below*

Drainage

physical studies related to drainage problems (*see* Physics, *below*): *Unit Soil Physics*

other references: Land Drainage *under* Agricultural Engineering, *page* 104

Fauna

biology of earthworms; earthworm and arthropod populations in relation to the speeding of recovery of marginal land under different manurial treatments; sampling techniques for soil arthropods; bionomics of millipedes: *Rothamsted*

biology of forest soils—litter fauna of different tree species singly and in mixture, together with their associated humus formations; funnel extraction methods: *Rothamsted*

effects of lime and phosphate on soil fauna: *W. Scot. Coll.*

other references: Eelworms, Leatherjackets, Wireworms, etc., *under* Plant Pests, *page* 30; Soil Treatments, *under* Insecticides and Fungicides, *page* 34

Fertility and Crop Response

inherent fertility of different types of soil, and relations between field behaviour, soil properties and laboratory findings, with particular reference to the evaluation of soil nutrient status: *Macaulay*

comparison of soil analyses with crop responses in field experiments: *N.A.A.S., Advisory Soil Chemists*

effect of soil nutrient balance on the establishment of, and competition between, plant species growing in association; e.g. the effect of soil potassium level on the ability of clovers to compete with grasses in the sward: *N. Ireland*

comparison of soil analyses with crop responses in field experiments: *Rothamsted*

other references: Rotation Experiments *under* Crop Husbandry, *page* 14

Forest Soils

soil factors affecting tree growth in the forest and the nursery; soil changes resulting from the afforestation of peat: *Macaulay* (in collaboration with *Forestry Commission*)

nutrition problems in forest nurseries: *Rothamsted* (in collaboration with *Forestry Commission*)

Fumigation

see Soil Treatments *under* Insecticides and Fungicides, *page* 36

Fungi in Soils

see under Microbiology, *page* 26

Glasshouse Soils

see under Glasshouse Crops *in* Crop Index, *page* 155

Irrigation

see Water Relations, *below*

Management

claying—value of claying on fen soils: *N.A.A.S., Eastern Province*

effect of clay marling. *N.A.A.S. Yorks., and Lancs. Province*

restoration of open-cast coal sites—depth of ploughing; method of applying phosphate to sites seeded to grass; relative value of restoration to grass and to arable; cultivation and manurial experiments; use of soil conditioners: *N.A.A.S., Provincial Centres*

restoration of land flooded by salt water—effect of gypsum on soil structure and crop growth; sequence of cropping for restoration; use of organic manures for market garden crops on salt-flooded land: *N.A.A.S., Provincial Centres*

other references: Soil Management in Orchards *under* Top Fruits *in* Crop Index, *page* 183

Metabolism and Microbiology

see Microbiology, *page* 24

Mineral Elements in Soils

mobilization and movement of *iron* in soils and plants, with reference to lime-induced chlorosis: *Long Ashton*

phosphorus relations of soils and crops; fixation of phosphate; availability of organic and inorganic compounds of phosphorus (*see also* phosphates *under* Fertilizers, *page* 11): *Macaulay*

examination of the *potassium* status of different soil types: *Macaulay*

distribution of *iron* and *aluminium* in soils: *Macaulay*

cation exchange and exchangeable ions in the soils of Northern Ireland, with special reference to soils of basic igneous origin: *N. Ireland*

inorganic and organic *phosphorus* compounds in soils; rate of mineralization of organic phosphates in soils, and the availability of inorganic forms: *N. Ireland*

organic chemistry of soil *phosphorus*: *Rothamsted*

determination of the exchangeable fraction of soil *phosphorus* by laboratory, pot and field experiments with radiophosphorus (*see also* Phosphates *under* Fertilizers, *page* 11): *Rothamsted*

effect of different crop rotations on soil *potassium*: *Rothamsted*

release of *magnesium* and *copper* from soil: *Rothamsted*

survey of trace elements in rocks and soils; determination of rare earths spectrographically; use of *Aspergillus niger* in determination of trace elements in soils: *Rothamsted*

distribution of *molybdenum* and other heavy metals: *Rothamsted, Soil Survey of England and Wales*

analytical methods for estimating available *phosphate* in soils: *W. Scot. Coll.*

other references: Spectrochemical Analysis, *below*

Mineralogy

mineralogical analyses of the sand fractions of selected soils and their parent materials from surveyed areas in Scotland: *Macaulay*

mineralogy of rocks and soils from Shropshire: *Rothamsted*

study of thin sections of soils: *Rothamsted*

other references: Pedology, *below*

Moisture

see Water Relations, *below*

Organic Matter

carbohydrate constituents of soil (including peat); nature of carbohydrates, fats and waxes produced by certain soil organisms: *Macaulay*

nitrogenous constituents of soil organic matter; origin and nature of humic constituents of soils and peats: *Macaulay*

see also Spectrochemical Analysis, *below*

organic chemistry of soil nitrogen; mineralization of organic nitrogen, with special attention to breakdown of 'mat'; denitrification: *Rothamsted*

soil organic matter in light soils: *Rothamsted*

other references: Peat, *below*; Organic Manures *under* Fertilizers and Manures, *page* 10

Peat

peat investigations—vegetation and pollen analysis: *Macaulay* (in association with the *Peat Survey of the Department of Agriculture for Scotland*)

peat studies and pollen analysis: *Rothamsted, Soil Survey of England and Wales*

Pedology

clay mineral studies

identification of clay minerals in soils and their relation to soil type: *Macaulay*

X-ray investigations—mineralogy of Scottish soil clays; weathering studies on selected soil profiles; development of methods of quantitative analysis for soil minerals; weathering of ferromagnesian minerals; clay-organic complexes: *Macaulay*

differential thermal analysis of Scottish soil clays and selected clays from other countries; d.t.a. of various minerals and weathering products of rocks; d.t.a. of minerals after chemical pretreatments; studies of various oxides of aluminium, iron and manganese in soil clays; semi-micro-analysis of selected pure minerals; effect of grinding on micaceous minerals; methods of separation of clay minerals: *Macaulay*

identification of clay minerals in soils and their relation to soil type: *Rothamsted*

mineralogy and morphology of soil clays; quantitative aspects of clay mineralogy: *Rothamsted*

heat capacities of water on expanding clay minerals; relations of structure to properties in clays; free oxides in soils: *Rothamsted*

other pedological studies

properties of aqueous plant extracts and their effects on sesquioxide and clay systems: *Rothamsted*

Physics and Physical Chemistry

physico-chemical and electronic methods applicable to the determination of inorganic and organic soil constituents

differential thermal analysis (*see* Pedology, clay mineral studies, *above*): *Macaulay*

surface properties of clay minerals—electric charges and buffer action at different crystal faces: *Rothamsted*

equilibrium and movement of water in soils; hydraulic permeability of saturated soil in the field; theory of flow of water down a gradient of moisture content; complementary flow of air and of water in unsaturated materials: *Unit Soil Physics*

effect of soil moisture on mechanical properties of soil: *Unit Soil Physics*

other references: Pedology, *above*; Structure, *below*

Spectrochemical Analysis

trace-element content of soils and herbage from upland pastures: *E. Scot. Coll.*

analysis of soils, soil parent materials, fertilizers, rocks, minerals, plant materials, animal organs, waters, etc., particularly for trace elements and in connexion with plant and animal disorders: *Macaulay*

geochemical distribution of trace elements and their occurrence and availability in soils: *Macaulay*

development of spectrochemical methods and equipment: *Macaulay*

study of constituents of soil organic matter by visible, ultra-violet and infra-red absorption: *Macaulay*

trace elements in soils and soil profiles in Northern Ireland: *N. Ireland*

survey of trace elements in rocks and soils; trace-element variation with manurial treatment: *Rothamsted*

micro-elements in soils and plants of hill land; distribution of micro-elements in herbage on different soil associations: *W. Scot. Coll.*

Sterilization

electrode method of soil sterilization: *E.R.A.*

steam sterilization of glasshouse soils—trials of equipment to increase efficiency: *Exptl. Hort. Stn., Fairfield*

steam sterilization of glasshouse soils; effect of steaming on soil nutrients other than nitrogen; injury to young plants raised in steam-sterilized soil: *Glasshouse Crops*

tests with volatile soil-sterilizing chemicals: *Glasshouse Crops*

Structure

variations in soil structure throughout a ley-farming rotation: *Aberdeen Univ., Dept. of Soil Science* (R.G.)

effects of various soil-management practices in orchards: *E. Malling*

studies of soil aggregation in glasshouse soils by the wet-sieving technique: *Glasshouse Crops*

changes in waterstable aggregates and soil porosity under grassland swards of various kinds and receiving various treatments: *Grassland R.S.*

effect of gypsum on non-flooded land: *N.A.A.S., Advisory Soil Chemists*

effect of tractor wheels and tracks on soil structure; mechanical properties of soils in relation to implement performance; relationship between soil stickiness, moisture content, and the dirt tare of root crops: *N.I.A.E.*

testing of stability of soil at successive stages in ley-arable rotation and after organic manuring; study of stabilizing action of organic matter by use of model high polymers; study of attractive and repulsive forces

between soil particles; slow swelling of pure calcium-saturated clays in water: *Rothamsted*

effect of soil moisture on mechanical properties of soil: *Unit Soil Physics*

Survey

survey and mapping of soils in Scotland; associated pedological studies: *Macaulay, Soil Survey of Scotland*

soil classification and surveys; soil mapping: *N. Ireland*

methods of interpreting air photographs as an aid in soil survey: *Oxford Univ., Dept. of Agriculture* (R.G.)

survey and mapping of soils in England and Wales; associated pedological studies: *Rothamsted, Soil Survey of England and Wales*

Temperature

temperature of air and soil under uncropped Dutch lights; distribution of soil temperature within the enclosed area and with depth: *Glasshouse Crops*

soil temperature in relation to activity of insect pests: *N.V.R.S.*

other references: Soil Warming *under* Agricultural Engineering, *page* 105

Water Relations

effects of soil moisture level on growth and cropping of fruit plants; development of methods of determining soil moisture: *E. Malling*

electrical methods of measuring soil moisture: *E.R.A.*

conditions for the control of soil moisture tension at different levels by auto-irrigation; comparisons of various types of tensiometers: *Glasshouse Crops*

development of a method of measuring moisture of soils by use of radioactive material: *Macaulay*

irrigation experiment at *Woburn* (carried on since 1951)—effects of overhead irrigation on farm crops: *Rothamsted*

checking of estimates of water needed by farm crops: *Rothamsted*

see also Dew Formation *and* Micro-Climate *under* Meteorology, *pages* 12 *and* 13

other references: Physics and Physical Chemistry, *above*; Irrigation *under* Crop Husbandry, *page* 14; Irrigation Machinery *under* Agricultural Engineering, *page* 104

FERTILIZERS AND MANURES

The work in this, the Soils and the Plant Physiology sections are closely related. Manurial experiments will also be found under Crop Husbandry, Grassland, and appropriate headings in the Crop Index.

Application

methods of applying nutrients to fruit trees; absorption and movement of nutrients applied as foliage sprays: *Long Ashton*

placement techniques; use of nutrient sprays; times of application of fertilizers; suitability of different methods for applying trace-element supplements: *Macaulay*

supply of nitrogen to fruit trees by spraying with urea: *N.A.A.S., Yorks. and Lancs. Province*

design of placement machinery; techniques for testing distributors: *N.I.A.E.*

placement of fertilizers and fertilizer mixtures for roots and cereals: *N. Ireland*

comparisons of placing and broadcasting individual nutrients for farm and horticultural crops: *Rothamsted*

Green Manuring

see under Crop Husbandry, *page* 14

Lime

comparison of different liming materials and frequency of application: *Exptl. Husb. Farm, Great House*

long-term experiment (started 1952) on liming of wold soils: *Exptl. Husb. Farm, High Mowthorpe*

influence of lime and other nutrients on the uptake of phosphorus by different crops; factorial experiments with lime and fertilizers; lime status of different soil types: *Macaulay*

trials of different liming materials; high and low rates of liming; liming of grassland: *N.A.A.S., Provincial Centres*

liming of mossland: *N.A.A.S., Yorks. and Lancs. Province*

survey of the chemical composition of quarried limestones in Northern Ireland: *N. Ireland*

effects of lime, alone and in combination with N, P and K, on yields and composition of farm crops: *N. Ireland*

cumulative effects of different quantities of lime applied to all crops of the North-East six-course rotation (started 1950): *N. Scot. Coll.*

Long-Term Effects

manurial reference plots laid down (1952) to assess cumulative effects of various treatments and to induce deficiencies for study: *Exptl. Hort. Stns., Efford, Luddington, Rosewarne*

manurial reference plots laid down (1952) to measure the cumulative effect of various treatments applied every year to the crops of a rotation: *Exptl. Husb. Farms, Bridget's, High Mowthorpe, Rosemaund, Trawscoed*

other references: Rotation Experiments *under* Crop Husbandry, *page* 14

Micro-Elements

effects of manuring with boron, manganese and magnesium on certain horticultural crops: *Exptl. Hort. Stn., Rosewarne*

trace-element deficiencies affecting crop production and animal health; trace-element status of different soil types; methods of application for trace-element supplements: *Macaulay*

field experiments with manganese, copper, boron and other trace elements in districts where deficiencies are known or suspected: *N.A.A.S., Provincial Centres*

other references: Spectrochemical Analysis *under* Soils, *page* 7; Nutrition *under* Plant Physiology, *page* 21

Nitrogenous Manures

ammonia liquor as a nitrogenous fertilizer for grass and potatoes: studies of 'liquid fertilizers': *E. Scot. Coll.*

comparison of different forms on grassland: *Exptl. Husb. Farm, Great House*

preparation and properties of urea-formaldehyde resins as slow-acting nitrogenous fertilizers: *Glasshouse Crops*

comparison of spray and solid applications of nitrogen and of different forms and times of application: *Macaulay*

value of gas liquor for arable crops and grassland: *N.A.A.S., Advisory Soil Chemists*

varietal responses of cereals to nitrogen: *N.I.A.B.*

types and times of application of nitrogenous manures for vegetables: *N.V.R.S.*

comparisons of different forms of nitrogen fertilizers: *Rothamsted*

soil nitrogen in relation to crop responses to nitrogen fertilizers: *Rothamsted*

slow-acting nitrogen fertilizers: *Rothamsted*

levels of nitrogen and time of application to spring cereals: *Rothamsted*

Organic Manures

cumulative effect of annual dressings of various forms of bulky organic manures (started 1952/3): *Exptl. Hort. Stns., Luddington, Rosewarne, Stockbridge House*

comparison of various bulky organic manures, one with another and against inorganics only, to assess physical effects on yield and quality of vegetable crops: *Exptl. Hort. Stn., Efford*

methods employed in handling farmyard manure from cowshed to field; comparison of labour and machine requirements: *N.I.A.E.*

various field experiments comparing organic and inorganic manures: *Rothamsted*

comparison of various composts and sewage sludge with farmyard manure and no organic manures (at *Woburn*, long-term experiment begun in 1942): *Rothamsted*

Phosphates

comparison of different forms on acid soils; effects of soil and rainfall on uptake of phosphorus; optimum dressings; radioactive tracer studies of recovery; residual effects: *E. Scot. Coll.*

crystal structures of calcium phosphates: *Edinburgh Univ., Dept. of Chemistry* (R.G.)

responses of sensitive horticultural crops to various phosphate applications, and changes in soil analysis arising from the treatments (long-term experiment started 1951): *Exptl. Hort. Stn., Stockbridge House*

build-up and effect over a period of years of residual phosphates resulting from varying rates of application to a rotation of vegetable crops (started 1955): *Exptl. Hort. Stn., Efford*

residual effects experiment—a four-course arable rotation comparing effects of varying levels of different forms of phosphate on the productivity of sensitive crops and on soil analysis: *Exptl. Husb. Farms, Boxworth, Bridget's, Gleadthorpe, High Mowthorpe, Rosemaund, Trawscoed*

most suitable phosphatic fertilizers for permanent grass: *Exptl. Husb. Farm, Great House*

effects of isotopic exchange on the validity of estimates of uptake by the use of radioactive phosphorus: *Long Ashton*

long-term experiments on residual effects; comparisons of different frequencies and rates of application; effectiveness of different forms of phosphate: *Macaulay*

field and pot studies of factors involved in phosphate fixation: *Macaulay*

use of radioactive phosphorus in studies of fixation, uptake, and available phosphate content of soils: *Macaulay*

comparison of types and sources of phosphate and nitrophosphate, testing on grass, swedes, potatoes, barley, kale and fodder beet: *N.A.A.S., Advisory Soil Chemists* (in collaboration with *Rothamsted*)

comparison of different kinds of phosphatic fertilizers applied with and without lime (begun 1932): *N. Scot. Coll.*

solubility relationships and constitution of rock phosphates: *Rothamsted*

availability of dicalcium phosphate in granular fertilizers: *Rothamsted*

residual effects of phosphate fertilizers: *Rothamsted*

correlation of available phosphate with crop response to phosphatic fertilizers: *W. Scot. Coll.*

other references: Nutrition *under* Plant Physiology, *page* 21

Placement
see Application, *above*

Potassium
responses of sensitive horticultural crops to various applications of sulphate of potash, and changes in soil analysis arising from the treatments (long-term experiment started 1952): *Exptl. Hort. Stn., Stockbridge House*

build-up and effect over a period of years of residual potash resulting from various rates of application to a rotation of vegetable crops (started 1955): *Exptl. Hort. Stn., Efford*

residual effects experiment—a four-course arable rotation comparing effects of varying levels and time of application of muriate of potash on the productivity of the crops and on soil analysis: *Exptl. Husb. Farms, Boxworth, Bridget's, Gleadthorpe, High Mowthorpe, Trawscoed*

potassium manuring of cereals and lucerne: *Rothamsted*

Salt
manurial experiments with agricultural salt: *N.A.A.S., Provincial Centres*

Survey
statistical survey of fertilizer practice: *Rothamsted*

METEOROLOGY

Research Institutes keep weather records and are concerned with studies of meteorological factors in the environments of plants and animals. This section is concerned only with projects involving physical measurements of environment.

Dew Formation
condensation on and evaporation from potatoes—with particular application to the study of potato blight: *Rothamsted*

Frost
frost damage in orchards and methods for its prevention: *E. Malling*

Glasshouse Climate
studies of incoming solar radiation, wind run, air temperatures and ventilation: *Exptl. Hort. Stn., Efford* (in collaboration with *N.I.A.E.*)

daily and seasonal light transmission in houses of different design and orientation; temperature variations of air and soil in relation to light transmission; plant response to light intensity: *John Innes*

measurement of heating requirements in relation to glasshouse design and to external weather changes; air movement and humidity: *John Innes*

measurements of radiation, temperature and air movement in the standard glasshouse; determination of heat balance; calibration of instruments for measuring glasshouse climate: *N.I.A.E.*

other references: Glasshouse Heating *under* Agricultural Engineering, *page* 102

Micro-Climate

micro-climate in relation to frost damage: *E. Malling*

wind movement during the pollination period of fruit trees, as affected by tree form and spacing: *E. Malling*

effects of shelter screens on the growth, habit, earliness and yield of horticultural crops: *Exptl. Hort. Stns.*

pilot trial of effects of a shelter belt on grass growth and micro-climate: *Exptl. Husb. Farm, Trawscoed*

effect of shelter belts on vegetation: *Hill Farm. R.O.*

micro-meteorology of irrigated crops: *Rothamsted*

micro-climate of potatoes and a cereal: *Rothamsted*

micro-climate created by windbreaks in horticultural crops in Scotland: *Scottish Hort. R.I.*

Radiation

radiation, heat and water exchange between soil and atmosphere: *Rothamsted*

CROP HUSBANDRY AND HORTICULTURE

Crop husbandry investigations are also indexed under Soils, Fertilizers, Plant Protection, Grassland and Agricultural Engineering, and under crops in the Crop Index. Some with a special bearing on farming systems, and others which are difficult to classify more precisely, are recorded below.

No distinction has been made between agricultural and horticultural crops, because researches on both fall under the same subject headings. Aspects of fruit culture sometimes classified as Pomology will be found in the Crop Index under Top Fruit, Soft Fruit, or the particular fruit species in question. Some aspects of glasshouse research and protected cropping are also listed in the Crop Index, under Glasshouse Crops.

Cultivation

comparison over a period of years of effects of various mechanical cultivations on crop yields (vegetables) and soil structure: *Exptl. Hort. Stns., Efford, Luddington, Rosewarne, Stockbridge House* (started 1952–5, in collaboration with *N.I.A.E.*)

comparison in a four-course rotation of various depths of ploughing and methods of incorporating fertilizer for root crops: *Exptl. Husb. Farms, Boxworth, Bridget's, Gleadthorpe, Terrington*

cultivation experiment (continuous since 1944) comparing immediate effects of deep and shallow ploughing on three crops, and second-year effects on the other three crops, of a six-course rotation: *Rothamsted*

Green Manuring

efficiency of Italian ryegrass as a green manure crop for subsequent horticultural crops: *Exptl. Hort. Stn., Stockbridge House*

four-course arable rotation experiment testing the value of green crops ploughed in as a means of maintaining fertility on poor sand land: *Exptl. Husb. Farm, Gleadthorpe*

long-term experiment at *Woburn* (carried on since 1936): *Rothamsted*

Irrigation

effects of irrigation on growth, yield and quality of a range of horticultural crops: *Exptl. Hort. Stns., Luddington, Stockbridge House* (in collaboration with *N.V.R.S.*)

value of irrigating the root crops in a rotation on sand land: *Exptl. Husb. Farm, Gleadthorpe*

irrigation of grassland in relation to water deficit and soil-moisture tension: *Grassland R.S.*

effects of supplementary irrigation on clover and grass swards: *Hannah*

effects of irrigation on herbage quantity and quality and on milk output: *N.I.R.D.*

irrigation of vegetable crops—effects of different irrigation regimes on yield and quality; relation of these effects to environmental factors influenced by irrigation; annual repetition of irrigation on the same site; use of meteorological data in regulating irrigation treatments; effect of irrigation on the nutrient status of the soil; organic matter content of soils in relation to stability of the surface soil under irrigation by spray-lines: *N.V.R.S.*

experiment (at *Woburn*) testing effects of overhead irrigation on sugar beet, barley, and main-crop potatoes (started 1950): *Rothamsted*

Rotation Experiments

effect on a 3-year arable rotation of various treatments of a preceding 3-year ley: *Exptl. Husb. Farms, Boxworth, Bridget's, Gleadthorpe, High Mowthorpe, Rosemaund, Trawscoed*

tests, by arable crop yields after ploughing, of the effects upon soil fertility of variously treated leys: *Grassland R.S.*

cumulative effects of differing amounts of nitrogenous, phosphatic and potash fertilizers applied to crops of a six-course rotation (begun in 1928): *N. Scot. Coll.*

six-course experiment to determine effects of seasonal variations in weather on response of crops to varying quantities of inorganic fertilizers without organic manures (repeated at *Woburn* and carried on since 1930): *Rothamsted*

three-course experiment involving comparison between straw and compost and inorganic manures (continuous since 1933): *Rothamsted*

ley-arable experiments in which the effects of a 3-year arable rotation, a 3-year stand of lucerne, and a 3-year ley for grazing, are compared in the yields of three subsequent crops (commenced 1949): *Rothamsted*

ley-arable experiment at *Woburn*, in which a 3-year arable rotation is compared with a 3-year stand of lucerne and a 3-year grazed ley as a preparation for testing crops of potatoes and barley (carried on since 1938): *Rothamsted*

Soil Management
see under Soils, *page* 3

Straw Disposal
effect of various methods of straw disposal on the productivity of a six-course arable rotation: *Exptl. Husb. Farms, Boxworth, Gleadthorpe, High Mowthorpe, Terrington*

trials at a medium level of manuring, started in 1936, on a four-course rotation; trial at a high level of manuring, started in 1949, on a six-course rotation: *Norfolk*

Windbreaks
effect of shelter screens on the growth, habit, earliness and yield of horticultural crops: *Exptl. Hort. Stns., Efford, Luddington, Rosewarne, Stockbridge House*

PLANT BREEDING AND GENETICS

Breeding programmes and genetical or cytological researches on particular crop plants are in the Crop Index, leaving under Plant Breeding and Genetics work on the principles and methods of plant breeding, together with researches in fundamental genetics and cytology. Some of the latter are common to plant and animal genetics; some work, for example, on *Drosophila* has been included because it is undertaken at the same time as plant investigations.

Biochemistry of Genetically Controlled Characters
flower pigments of *Antirrhinum, Primula sinensis*, and *Rosa*: *John Innes*

Breeding Systems and Incompatibility
incompatibility in *Freesia refracta*; cleistogamy in *Salpiglossis sinuata*; general survey of incompatibility in plants: *John Innes*

Continuous Variation

study of polygenic variability in different environments, using homozygous diploids derived from haploids: *John Innes*

comparison of selection at different degrees of rigour in relation to population size; effects of gametophytic competition on the segregation of characters under both major-genic and polygenic control: *John Innes*

selection for, and inheritance of, polygenically controlled characters: *John Innes*

statistical problems connected with analysis of characters showing continuous variation: *N.V.R.S.*

developmental stability in the individual: *Sheffield Univ., Dept. of Genetics* (R.G.)

analysis in the descendants of crosses between true breeding parents; diallel crosses; backcrossing as an aid to the analysis of F_2; assortative mating; genotype/environment interaction; the units of continuous variation; stability in development: *Unit Biomet. Gen.*

measurement and analysis of selection in relation to continuous variation: *Unit Biomet. Gen.*

Cytology and Chromosome Behaviour

experimental control of crossing over—action of infra-red, effects of temperature, technique for anther culture: *John Innes*

breakage of chromosomes by irradiation and by chemical agents, study of effects: *John Innes*

chromosome chemistry—nucleic acid measurements, differences between euchromatin and heterochromatin, nuclear and cell differentiation: *John Innes*

centromere structure and behaviour: *John Innes*

analysis of chromosome behaviour in hybrids: *John Innes*

endosperm development: *John Innes*

nature of the genetical control of chromosome behaviour, and its relation to the breeding system; effects of inbreeding and hybridization; selection for heterozygosity in natural and inbred populations: *Unit Biomet. Gen.*

cytogenetical studies of plants of economic importance: *Univ. Coll. Wales, Dept. of Agric. Botany* (R.G.)

Cytoplasmic Inheritance

cytoplasmic inheritance in tomatoes: *John Innes*

Genecology

mechanisms of natural selection and the resulting patterns of hereditary variation in species of uncultivated grassland: *Scottish P.B.S.*

genetic control of quantitative characters in relation to environment: *Univ. Coll. Wales, Dept. of Agric. Botany* (R.G.)

Genetics of Micro-organisms

nature and origin of physiologic races in *Phytophthora infestans*: *Cambridge Univ., School of Botany* (R.G.)

mutations affecting pathogenicity and growth requirements in *Cladosporium fulvum*: *John Innes*

biochemical and incompatibility mutants in *Coprinus lagopus*; the cytoplasmic and genic control of cytochrome oxidase in *Coprinus*: *John Innes*

cytoplasmic variation in fungi—the role of the cytoplasm in differentiation, degeneration and adaptation; maintenance of cytoplasmic balance in nature; the units of cytoplasmic change; interaction of nucleus and cytoplasm in heterokaryons: *Unit Biomet. Gen.*

Interspecific Relationships

study of species and hybrids in *Antirrhinum* and their incompatibilities: *John Innes*

interspecific and intergeneric relationships in Triticinae: *Pl. Br. Inst.*

Mutation

artificial induction of mutations in cereals by irradiation of seeds with X-rays and fast and slow neutrons: *Pl. Br. Inst.*

properties and measurement of polygenic mutation: *Unit Biomet. Gen.*

Storage of Genetic Material (seeds)

effects of time and conditions of storage on germination and yield of various seeds: *John Innes*

Variety Testing

varieties of fruit plants: *N.A.A.S., National Fruit Trials and Exptl. Hort. Stns.*

botanical descriptions for identification and classification of varieties and strains of field crops: *N.I.A.B.*

field trials of cereals, herbage plants, potatoes, roots, vegetables and other field crops at thirteen Regional Trial Centres: *N.I.A.B.* (also in collaboration with *N.A.A.S.*)

botanical observations for identification and registration purposes: *Pl. Reg. Stn.*

other references: Strain Trials *under* Grassland, *page* 49; *entries under crops in* Crop Index

PLANT PHYSIOLOGY AND BIOCHEMISTRY

Abscission

abscission in fruit plants—observations on incidence of fruit drop; inhibition of abscission by synthetic and natural growth substances; induction of abscission by plant protective chemicals and other agents: *E. Malling*

interaction of auxins and auxin-antagonists in the control of abscission: *Long Ashton*

physiology of leaf abscission with special reference to its regulation by natural and synthetic substances: *Unit Exptl. Agron.*

Chemistry of Plant Components

metabolites of the apple tree—nature, amount and utilization of compounds of importance in growth and reproduction: *E. Malling*

biochemical aspects of host/parasite relations in the parasitism of different varieties of apple and pear by *Venturia* spp.: *E. Malling*

studies of plant nucleic acids, especially in sugar beet: *Pl. Br. Inst.*

biochemical studies of components of the leaf, with special reference to virus infection: *Rothamsted*

large-scale preparation of leaf protein; *in vitro* study of leaf protein: *Rothamsted*

changes in content of oxalic acid and other organic acids during wilting of sugar beet leaves: *Rothamsted*

isolation and study of simple plant glucuronides: *Rowett*

organic constituents of fruit plants, especially the characterization and distribution of phenolic substances; basal constituents of tomato plants in relation to mineral status—major and micro-nutrients: *Unit Pl. Nutr.*

other references: Chemistry of Herbage Plants *under* Grassland, *page* 42

Enzyme Systems

phospholipase D of plant tissues: *Aberdeen Univ., Dept. of Biological Chemistry* (R.G.)

mechanism of starch-carbohydrase action: *Lister Inst., Dept. of Biochemistry* (R.G.)

oxidation mechanisms in plant respiration: *Oxford Univ., Dept. of Botany* (R.G.)

nucleoside hydrolases of plant tissues: *Res. Inst. Pl. Phys.*

see also Photosynthesis and Carbohydrate Metabolism, *below*

metabolism of the compounds of Δ' pyrroline and Δ' piperideine formed as a result of oxidations catalysed by plant amine oxidase; formation of other heterocyclic compounds as a result of reactions catalysed by plant amine oxidase or other plant enzymes: *Rothamsted*

formation of indolyl-3-acetaldehyde by the oxidation of tryptamine catalysed by plant amine oxidase: *Rothamsted*

factors affecting the extraction and activity of plant oxidative enzymes; effect of the physiological state of the plant, particularly mineral deficiencies, on the activity of certain oxidative enzymes: *Rothamsted*

enzymic composition of bracken at different stages of growth; substrate specificity and inhibitors of bracken thiaminase: *Rothamsted*

disproportionating enzyme (D-enzyme) of plants: *Univ. Coll. N. Wales, Dept. of Chemistry* (R.G.)

other references: Photosynthesis and Carbohydrate Metabolism, *below*; Physiology in Relation to Virus Infection, *below*

Germination of Seeds

effects of time and conditions of storage on germination and yield of seeds: *John Innes*

physiology of delayed germination in cereals: *N.I.A.B.*

causes of poor germination in strains of beet: *N.V.R.S.*

methods of carrying out germination tests; effects of seed dressings; dormancy of oats: *Pl. Reg. Stn.*

metabolism of spring and winter rye during germination at high and low temperature: *Res. Inst. Pl. Phys.*

Growth

analysis of growth in fruit trees, with reference to rootstock/scion interactions; developmental studies; the physiological basis of response to stem pruning: *E. Malling*

growth studies of timothy grass and meadow fescue; leaf-area determinations; tiller production; effects of cutting at different stages of development; growth and fertile tiller production at different levels of nutrition: *Grassland R.S.*

physiological studies on the dormancy of apple seeds; effect of cold period on bud break and subsequent growth of different varieties of fruit plants: *Long Ashton*

analysis of the factors controlling extension of the coleoptile and mesocotyl of *Avena* (at *Chelsea Physic Garden*): *Res. Inst. Pl. Phys.*

growth of fruit-tree rootstocks under controlled conditions; studies in assimilation in relation to growth (at *East Malling*): *Res. Inst. Pl. Phys.*

use of growth analysis methods to investigate the physiological basis of variation in growth and yield; varietal and specific differences; effects of variation in time of application of fertilizers; maximum yield of dry matter and protein under different techniques of management; effects of variation in water stress, in relation to irrigation practice: *Rothamsted*

cellular aspects of growth and metabolism; the processes of cell division and cell expansion in meristems and adjacent regions; development of ultra-micro techniques to investigate the metabolic characteristic of cells in division and in subsequent stages of expansion: *Unit Cell. Phys.*

Growth-Regulating Substances

natural hormones in fruit trees—extraction, biological assay, and chromatographic separation; distribution of growth promoters and inhibitors in

vegetative shoots; movement of growth substances in the stem; effect of growth substances on development of lateral branches and their angle with the stem: *E. Malling and Res. Inst. Pl. Phys.*

the fate of indole-3-acetic acid and related substances in metabolism and growth: *London Univ., King's Coll., Dept. of Botany* (R.G.)

mechanism of action of indolyl-acetic acid and related growth substances: *London Univ., King's Coll., Dept. of Botany* (R.G.)

effect of lime-sulphur and captan sprays on auxin production by apple leaves, and on fruit set and fruit drop: *Long Ashton*

trials of chemical fruit thinning agents; comparison of various sprays for fruit-drop control in apples: *Long Ashton*

factors affecting entrance and translocation of NAA in the apple; effect of NAA sprays on carbon fixation by the apple leaf: *Long Ashton*

effect of growth substances on fruit growth in apples following seed destruction: *Long Ashton*

relative toxicity of substituted phenoxyacetic and phenoxybutyric acids to apples and pears: *Long Ashton*

synthesis of auxin in isolated embryos of rye (at *Chelsea Physic Garden*): *Res. Inst. Pl. Phys.*

growth substances associated with bulb development in onions (at *S. Kensington*): *Res. Inst. Pl. Phys.*

effects of indole-3-acetic acid on cell metabolism, especially amino acid metabolism: *Unit Exptl. Agron.*

mode of action of substances affecting extension growth in plants: *Unit Exptl. Agron.*

movement of growth-regulating substances in plants, particularly the mechanism of polar transport: *Unit Exptl. Agron.*

synthesis of labelled organic growth-regulators; relationship between structure and phytotoxicity or physiological activity: *Unit Exptl. Agron.*

assessment of plant growth-regulating activity; synthesis of compounds for studies on the relationships between chemical structure and activity; mode of action: *Unit Syst. Fung.*

enzymatic degradation of certain aryloxyalkane-carboxylic acids, their amides and nitriles, within plant tissues and by organisms isolated from soil: *Unit. Syst. Fung.*

distribution of growth hormones and hormone inhibitors in various plant tissues at different stages of development; metabolism and mode of action of auxins: *Unit Syst. Fung.*

other references: Abscission, *above*; Vegetative Propagation, *below*; Chemistry and Physiological Action of Herbicides *under* Weeds & Weedkillers, *page* 38

Nutrition

(*note:* specific elements are italicized to facilitate reference)

mineral nutrition of fruit plants—analytical methods; uptake, distribution and utilization of mineral elements in relation to growth and cropping; development of techniques for culture of fruit plants under controlled conditions of nutrition: *E. Malling*

effects of varying *iron* and *magnesium* supply to apple trees in spray culture: *E. Malling* (*see also* Chemistry of Plant Components, *above*), *E. Malling*

mineral deficiencies in glasshouse crops: *Glasshouse Crops*

effects of manurial treatments and of cover crops on growth, yield and nutrient status of fruit plants; effect of *iron* chelates on lime-induced chlorosis in fruit trees; behaviour of iron chelates in soil; absorption and movement of nutrients applied as foliage sprays; techniques for growing fruit plants in sand, water, and mist cultures: *Long Ashton* (*see also Unit Pl. Nutr. below*).

effects of excess heavy metals on plant metabolism; role of *copper* in the physiology of plants; studies on the absorption and translocation of heavy metals and their identification in tissue by autoradiography and paper chromatography: *Macaulay*

biochemical background of chlorosis: *Macaulay*

uptake of *phosphorus* by isolated roots and tissues: *Macaulay*

field, pot and laboratory studies of phosphate fixation: *Macaulay*

potassium deficiency—metabolic production of putrescine in potassium-deficient plants (at *Rothamsted*): *Res. Inst. Pl. Phys.*

effect of various nutrient deficiencies on the phyllotaxy of flax (at *Rothamsted*): *Res. Inst. Pl. Phys.*

mobility of metallic ions in plant tissues (at *E. Malling*): *Res. Inst. Pl. Phys.*

growth analysis of vigorous and dwarfing apple rootstocks with special reference to net assimilation rates at varying levels of *nitrogen* supply (at *E. Malling*): *Res. Inst. Pl. Phys.*

nutritional problems of poor acid soils (forest nurseries): *Rothamsted*

effectiveness of various *iron* complexes in supplying iron in culture solutions: *Rothamsted*

uptake of nutrients by excised root systems; comparisons of uptake by different species and varieties of crop plants: *Rothamsted*

nutrient uptake by leaves; factors affecting *phosphorus* uptake, studied by use of radiophosphorus; investigation by autoradiography of the distribution of ions absorbed through the leaves: *Rothamsted*

effect of mineral deficiencies on the activity of certain oxidative enzymes: *Rothamsted*

accumulation of higher valency forms of *manganese* in plants under conditions of manganese toxicity: *Rothamsted*

the role of *zinc* in controlling enzyme actions *in vivo*: *Rothamsted*

micro-element nutrition of higher plants with special attention to *molybdenum*, *cobalt* and *vanadium*; role of *molybdenum* in the growth of cauliflower; aldehyde oxidase in relation to the role of metals in nitrate metabolism; development of tissue-culture methods for studying the role of micro-nutrients and of water-culture methods for special studies: *Unit Pl. Nutr.*

micro-element nutrition of micro-organisms; role of *molybdenum* and *vanadium* in nitrate reductase systems, in nitrogen fixation, and in symbiotic relations of *Rhizobium* and clover; role of micro-nutrients in biological oxidation processes in bacteria; biochemical mutants—requirements for trace metals and vitamins; *cobalt* requirements of micro-organisms: *Unit Pl. Nutr.*

effects of micro-element deficiencies on iron-containing haem-protein compounds in chloroplasts: *Unit Pl. Nutr.*

valency states of *molybdenum* and *vanadium* in plants: *Unit Pl. Nutr.*

see also Chemistry of Plant Components, *above*: *Unit Pl. Nutr.*

other references: many entries under Fertilizers and Manures, *page* 8; Herbage Production *under* Grassland, *page* 45; Nutrition *under specific crops in* Crop Index

Photoperiodism

daylength requirement for flowering of various grass species: *Grassland R.S.*

experiments with *Kalanchoe*—inhibitory effects of long days; translocation of the flowering stimulus by leaf grafting (at *Rothamsted*): *Res. Inst. Pl. Phys.*

dark fixation of carbon dioxide in relation to flower induction (at *Rothamsted*): *Res. Inst. Pl. Phys.*

other references: Vernalization, *below*

Photosynthesis and Carbohydrate Metabolism

biosynthesis of leaf hemicelluloses: *Bristol Univ., Dept. of Organic Chemistry* (J.R.F.)

photosynthesis in *Chlorella*: *Cambridge Univ., School of Botany* (R.G.)

pathways and mechanisms of polysaccharide synthesis in plants—effect of temperature on starch metabolism and respiration in tobacco leaves; maltose as substrate for starch synthesis; effect of nitrogen nutrition on starch metabolism of tobacco leaves; carbohydrate metabolism in wheat seedlings: *Res. Inst. Pl. Phys.*

other references: Enzyme Systems, *above*; Stomatal Behaviour, *below*

Physiological Disorders
non-pathogenic disorders of fruit plants, especially fruit-splitting in cherries and plums: *E. Malling*

Physiology in Relation to Virus Infection
effect of infection with tobacco mosaic virus, on the respiration of tobacco leaves: *Rothamsted*

study of various leaf enzyme systems which may play a part in controlling the infectivity of virus preparations: *Rothamsted*

changes of composition accompanying alteration in susceptibility to virus infection produced by interruption of photosynthesis in bean leaves: *Rothamsted*

biochemical studies of components of the leaf, with special reference to virus infection: *Rothamsted*

other references: Viruses *under* Plant Diseases, *page* 28

Radioactive Tracer Studies
auto-radiographic technique combined with chromatographic analysis; investigation of lime-induced chlorosis with ^{59}Fe; use of isotopes in the study of the intermediary metabolism of micro-organisms; investigation of the behaviour of growth-regulating substances in plants using ^{14}C: *Long Ashton*

use of radioactive phosphorus in studies of phosphate fixation, uptake of applied phosphorus, and available phosphorus in soils: *Macaulay*

autoradiography of tissues to determine distribution of mineral nutrients within the plant: *Macaulay*

development of methods of assay for ^{14}C in plant tissue: *Unit Exptl. Agron.*

Root Studies
root development of fruit plants in relation to soil conditions: *E. Malling*

growth of tomato roots in glasshouse borders; relation with growth and fruiting of the plant above ground; studies of root environment, especially soil moisture: *Glasshouse Crops*

root development in a range of species and strains of grassland plants; critical study of root systems in particular grasses and clovers: *Grassland R.S.*

physiological studies of the growth and function of roots in herbage plants: *Grassland R.S.*

root development of herbage plants and its effect on soil fertility: *Welsh P.B.S.*

Spray Damage to Fruit Plants
study of natural resistance to damage by copper: *Res. Inst. Pl. Phys. and E. Malling*

Stomatal Behaviour

minimum carbon dioxide content of illuminated leaves during assimilation; development of a new porometer suitable for leaves without continuous intercellular spaces; mechanics of stomatal movement (at *S. Kensington*): *Res. Inst. Pl. Phys.*

Vegetative Propagation

vegetative propagation of fruit-tree rootstocks by cuttings—varietal characteristics, physiological condition of the source plant, growth substance relations, and effects of environmental factors: *E. Malling and Res. Inst. Pl. Phys.*

techniques for propagating Brassicae with a view to investigating off-types: *N.I.A.B.*

propagation of plants from root cuttings: *Nottingham Univ., School of Agriculture* (R.G.)

other references: Rootstocks *under* Apple *and other fruit species in* Crop Index

Vernalization

varietal differences in growth of cereal seedlings after vernalization: *N.I.A.B.*

vernalization and devernalization of growing plants; short-day induction and its interaction with vernalization; effect of intercalating a day at neutral temperature in an alternating temperature cycle (at *Chelsea Physic Garden*): *Res. Inst. Pl. Phys.*

metabolism of spring and winter rye during germination at high and low temperature (at *Chelsea Physic Garden*): *Res. Inst. Pl. Phys.*

experiments with *Chrysanthemum*—interactions of day length, duration of vernalization and temperature; growth analysis over a range of treatments; effects of growth hormones and antiauxins on vernalization (at *Rothamsted*): *Res. Inst. Pl. Phys.*

Water Relations

usage of soil moisture by fruit plants, in relation to meteorological conditions; effects of soil moisture level on growth and cropping of fruit plants; effects on the fruit tree of interrupting the conducting system: *E. Malling*

MICROBIOLOGY

Microbiological investigations are associated with several branches of agricultural research. As these investigations have common techniques and form a specialized field, some of them have been brought together here with cross-references to those

occurring in other sections. Soil microbiology is given a sub-section.

Bacterial Pathogens of Animals
see Bacteria and Bacterial Diseases, *page* 80

Bacterial Pathogens of Plants
see Plant Diseases, *page* 27

Bacterial Viruses
biochemical studies of bacteriophages; effects of purine and pyrimidine analogues on virus multiplication, and on the nucleic acid metabolism of bacteria: *Unit Virus Res.*

Bacteriology of Silage
properties and classification of the species of *Lactobacillus* that occur in silage; effects on silage of inoculation with lactobacilli; methods of preparing active inocula: *E. Scot. Coll.*

production of bacteriologically sterile grass; chemical changes in such grass and in pure bacterial cultures on grass: *E. Scot. Coll.*

anaerobic bacterial actions on organic acids in silage; conditions that control the growth and activity of clostridia in silage: *E. Scot. Coll.*

properties of species of *Streptococcus* derived from silage: *E. Scot. Coll.*

Biochemistry and Metabolism of Micro-Organisms
production of vitamin B_{12} by micro-organisms; methods of assay: *E. Scot. Coll.*

biochemistry of moulds: *London Univ., London School of Hygiene and Tropical Med.* (R.G.)

formation of fatty acids by anaerobic bacteria and extracts thereof: *Unit Microb.*

bacterial photosynthesis: *Unit Microb.*

isolation and properties of bacterial cytochromes: *Unit Microb.*

development of continuous culture techniques for the study of anaerobic bacteria: *Unit Microb.*

role of molybdenum and vanadium in nitrate reductase systems in fungi and bacteria; and in nitrogen fixation by *Azotobacter* and *Clostridium*; role of micro-nutrients in biological oxidation processes in bacteria; biochemical mutants—requirements for trace metals and vitamins; cobalt requirements of micro-organisms: *Unit Pl. Nutr.*

other references: Chemical Physiology and Biochemistry, *page* 75; Digestion (Role of Micro-organisms), *page* 64; Soil Microbiology, *page* 26

Genetics of Micro-organisms
see Plant Breeding and Genetics, *page* 15

Microbiology of Cider-making
isolation and classification of organisms occurring naturally in apple juice; nutrition and metabolism of particular organisms; role of the organisms in fermentations and disorders; use of selected yeasts to standardize fermentations: *Long Ashton*

SOIL MICROBIOLOGY

Actinomycetes
thermophilic actinomycetes from composts: physiological studies on paraffin- and fat-decomposing *Nocardia* spp. in soils: *Macaulay*

Fungi
growth of fungi isolated from decomposing roots in grassland: *Grassland R.S.*

fungal metabolism; decomposition of lignin by fungi: *Macaulay*

chemical composition and fractionation of high-molecular-weight components of soil fungi; bacterial attack on these components: *Rothamsted*

Metabolism
nature of carbohydrates, fats and waxes produced by certain soil organisms: *Macaulay*

Microbial Decomposition in Soils
micro-organisms isolated from grass roots and their influence on the decomposition of organic matter in the soil: *Grassland R.S.*

organisms decomposing the chloro-phenoxyacetic herbicides; the adaptation of soil to decompose these substances and rate of loss of the adaptation: *Rothamsted*

Microbial Populations
techniques for sampling micro-organisms active in grass swards: *Grassland R.S.*

microbial flora from normal and intensively managed grassland soils: *N. Scot. Coll.*

factors influencing the establishment of a micro-organism in soil and its differential increase: *Rothamsted*

effects of partial sterilization, especially on the activity of antibiotic organisms in soil: *Rothamsted*

methods for estimating the numbers of important groups of soil organisms, particularly those concerned with nitrification and nitrogen fixation: *Rothamsted*

Microflora of Eggs
see Eggs, *page* 97

Microflora of Milk and Milk Products
see Milk, bacteriology, *page* 98; Cheese and Cheesemaking, *page* 97

Mycorrhiza

mycorrhizal relations of fruit plants: *E. Malling*

Nitrifying Organisms

metabolism of nitrifying bacteria: *Aberdeen Univ., Dept. of Biological Chemistry* (R.G.)

search for bacteria that will nitrify in acid soils; mineral requirements of nitrifiers: *Rothamsted*

Nodule Bacteria of Legumes

relative efficiency of *Rhizobium* strains in clovers: *E. Scot. Coll.*

influence of environmental factors on the nodulation of legumes: *Grassland R.S.*

search for strains of clover nodule bacteria more suitable for use for seed inoculation; study of the development of ineffective mutants of *Rhizobium* in soil: *Rothamsted*

growth of *Rhizobium* in the root surroundings as affected by the host legume: *Rothamsted*

physiology of the host legume in relation to nodulation study of bacteriophage and its effects in producing ineffective mutants in *Rhizobium*: *Rothamsted*

role of molybdenum and vanadium in the symbiotic relations of *Rhizobium* and clover-effective and non-effective strains in relation to micronutrients: *Unit Pl. Nutr.*

study of the nodule organism in relation to inducing nodule formation in *Trifolium ambiguum*: *Welsh P.B.S.*

Rhizosphere

methods for analysis of the microflora of the rhizosphere: *E. Scot. Coll.*

interactions of bacteria in the rhizosphere: *London Univ., Imperial College, Dept. of Botany* (R.G.)

study of the root-surface flora of certain plants: *Macaulay*

effects of partial sterilization on the rhizosphere microflora, with special regard to soil fungi: *Rothamsted*

PLANT PROTECTION

A. PLANT DISEASES

Most of the work in progress on bacterial, fungal and virus diseases of particular crops has only been entered in the Crop Index, because it is usually convenient to list plant diseases according to the host plants attacked. The researches entered

below are those of wider application or ones concerned with groups of crops.

Assessment

assessment of damage done by plant diseases; regional and seasonal surveys: *Pl. Path. Lab.*

assessment of economic significance of crop diseases and correlation with meteorological data: *W. Scot. Coll.*

Bacterial Pathogens

maintenance of a collection of bacterial plant pathogens; identification by serology: *Pl. Path. Lab.*

Host/Parasite Relations

apple and pear scab (*Venturia* spp.)—the biochemistry of host/parasite relations: *E. Malling*

Verticillium wilt diseases of hops and fruit—the mechanism of wilt and host tolerance; toxin assay and purification; host-toxin reactions; mode of entry, invasion and colonization: *E. Malling*

nutritional status of various crops in relation to disease: *W. Scot. Coll.*

Non-Pathogenic Disorders

see Physiological Disorders *under* Plant Physiology, *page* 23

Physiology of Fungi

soil ecology of pathogenic species of *Verticillium*: *E. Malling*

fat production by fungi on artificial media: *London Univ., Imperial College, Dept. of Botany* (R.G.)

factors governing sporulation of *Sclerotinia* spp. in culture; spore production and dissemination in various species pathogenic to fruit plants: *Long Ashton*

overwintering of fungi pathogenic to fruit plants: *Long Ashton*

Seed-borne Diseases

methods for assessing the infection of seed samples: *N.I.A.B.*

examination of seed stocks; efficacy of seed treatments: *Pl. Reg. Stn., D.A.S. Plant Path. Service*

Spore Dispersal

routine spore trapping; study of the conditions under which plant pathogenic fungi produce and liberate their spores; wind-tunnel tests to study the deposition of spores on leaves and stems: *Rothamsted*

Viruses

virus diseases of fruit and hops: aetiology—transmission, symptom and host ranges, symptom expression, environmental factors in incidence of spread, vector relations, virus analysis, varietal susceptibility: *E. Malling*

control—health assessment, selection and maintenance of healthy stocks, nature of resistance and klendusity, virus inactivation in hosts by heat and chemical means: *E. Malling*

virus diseases of glasshouse crops; attempted therapy by heat and chemical treatments: *Glasshouse Crops*

molecular structure of plant viruses: *London Univ., Birkbeck College, Dept. of Physics* (R.G.)

miscellaneous virus diseases in vegetable crops: *N.V.R.S.*

biochemical properties of plant viruses and biochemical factors affecting their liberation and infectivity: *Rothamsted*

changes in protein content of leaves caused by infection: *Rothamsted*

use of substances that inhibit infection to control tomato mosaic: *Rothamsted*

effects of changing environment, and particularly temperature, on virus multiplication; curing of infected plants by high temperatures: *Rothamsted*

study of virus multiplication in tissue cultures and root-culture: *Rothamsted*

distribution of virus in infected plants, to find particularly whether it occurs in apical meristems: *Rothamsted*

host range, transmissibility and serological relationship of carnation latent virus, potato virus S, and potato paracrinkle virus: *Rothamsted*

test of the value of the gel-diffusion method of making serological tests with plant viruses: *Rothamsted*

comparison of actions of radiation, enzymes and other substances on plant viruses, bacteriophage and antibodies: *Rothamsted*

electron microscopy—study of viruses in infected cells by electron microscopy of thin sections; development of mounting techniques to preserve three-dimensional structures of viruses and other particles: *Rothamsted*

relationships of the various viruses that cause yellowing in sugar beet; the transmission of these viruses by aphids: *Rothamsted*

incidence, spread and control of virus diseases in the field (*see* Brassicae, Potato, *and* Sugar Beet *in* Crop Index): *Rothamsted*

see also Physiology in Relation to Virus Infection *under* Plant Physiology, *page* 23: *Rothamsted*

virus diseases of soft fruit (especially raspberries); spread of aphid-borne viruses in potatoes: *Scot. Hort. R.I.*

virus diseases of potato—comparison of pathogenicities, physical characters and serological relationships of virus strains; field studies of spread: *Scot. P.B.S.*

isolation, purification and crystallization of plant viruses: *Unit Virus Res.*

inter-relationship between virus proteins and their nucleic acids, and its importance in virus multiplication: *Unit Virus Res.*

investigation of the structure of virus nucleic acids, and of other nucleic acids, by chemical and enzymic degradation methods: *Unit Virus Res.*

electron microscopy and morphology of viruses; application of the thin-section cutting technique to the study of viruses in the cell: *Unit Virus Res.*

physiology of plant virus diseases—controlled environment studies; effects of various factors on susceptibility: *Unit Virus Res.*

latency in viruses: *Unit Virus Res.*

B. PLANT PESTS

This section includes the birds and mammals that damage growing or harvested crops, as well as some of the smaller animals (eelworms, insects, mites and slugs) to which the term is occasionally restricted. Work on pests associated with particular crops is indexed under the host plant in the Crop Index, while work on the chemical control of insects and mites is included under Insecticides and Fungicides.

Birds and Mammals

migration of birds injurious to agriculture, particularly the movement of wood-pigeon flocks; assessment of damage and surveys of breeding areas and the use of narcotics for control of the wood-pigeon; social behaviour of rooks and their control; study of bullfinches in relation to damage done to fruit tree buds: *M.A.F.F. Infest. Control*

improvement of methods of control of rats and mice by anticoagulants and other poisons: *M.A.F.F. Infest. Control*

home range and other behaviour of house mice in large stacks of grain; water requirements of house mice: *M.A.F.F. Infest. Control*

economic importance of the rabbit, methods of control, myxomatosis and its vectors, rate of spread and attenuation of the disease; effect on populations of predators and use of traps: *M.A.F.F. Infest. Control*

biological studies of the grey squirrel, its economic importance, trapping and shooting as methods of control: *M.A.F.F. Infest. Control*

trials of various chemical repellants against bird attacks on fruit buds: *N.A.A.S., South-Eastern Province*

investigation of fleas as carriers of myxomatosis of rabbits, and in their relationships with other mammals and birds: *N. Scot. Coll.*

Eelworms

biology and control of nematodes of fruit plants: *E. Malling*

systematics and bionomics of soil and plant nematodes; maintenance of reference and type collections: *Rothamsted*

host ranges of biological races of *Ditylenchus dipsaci*; biology of *D. destructor*; biology of *Hoplolaimus uniformis* and its relationships with Sitka spruce: *Rothamsted*

morphology and host ranges of species of *Meloidogyne* causing root-knot: *Rothamsted*

Systematics and bionomics of the genus *Aphelenchoides*: *Rothamsted*

population studies of cyst-forming nematodes (*Heterodera* spp.): *Rothamsted*

root diffusate studies (potato root eelworm)—production, diffusion and breakdown; chemical nature of the hatching factor; effect of lethal agents on the hatching process: *Rothamsted*

nematode behaviour—factors affecting activity and movement in soil: *Rothamsted*

preliminary study of serological tests for the determination of species: *Rothamsted*

mixing of nematicides with soil; use of radioactive tracers to test efficiency of soil mixing: *W. Scot. Coll.*

other references: specific crop studies, in Crop Index, *under* Black Currant, *page* 144; Cereals, *page* 150; Chrysanthemum, *page* 152; Mushroom, *page* 162; Oats, *page* 162; Peas, *page* 165; Potato, *page* 168; Strawberry, *page* 175; Sugar Beet, *page* 177; Tomato, *page* 179

GENERAL ENTOMOLOGY

Insect Ecology

natural control of orchard pests—effects of spray programmes on predators and parasites; life histories of beneficial insects; technique of population studies: *E. Malling*

studies of insect populations, on cereals and on the broom plant: *London Univ., Imperial College, Dept. of Zoology and Applied Entomology* (R.G.)

insect/host plant relations—effects of variety and cultural practices on attack by pests of fruit plants: *Long Ashton*

soil temperature and its effects on the activity and seasonal appearance of some insects of economic importance: *N.V.R.S.*

vertical distribution of insects in the air; changes in the diversity of populations with altitude; flight periodicity of insects in relation to vertical distribution: *Rothamsted*

effect of crowding of insects on their behaviour and physiology: *Rothamsted*

insect migration: *Rothamsted*

effects of climatic conditions on insect metabolism and behaviour; fat metabolism and temperature: *Rothamsted*

ecology of springtails: *W. Scot. Coll.*

see also under Aphids, *below*: *Rothamsted*

Insect Physiology

development and testing of an experimental cabinet having controlled light, temperature and humidity: *Unit Insect Phys.*

structure and physiology of the insect egg: *Unit Insect Phys.*

insect cuticle—physical and physiological transport of water and other substances through the cuticle; chemistry and secretion of cuticular wax and cement: *Unit Insect Phys.*

Insect Traps

assessing errors in density estimates by suction traps; vacuum suction method for sampling insects in herbage: *Rothamsted*

Pest Assessment

assessment of damage done to crops by insects and other pests: *Pl. Path. Lab.*

Virus Diseases of Insects

genetical aspects of polyhedral virus disease in insects: *Oxford Univ., Dept. of Zoology* (R.G.)

natural history of insect virus diseases; mode of spread, symptomatology, cross-inoculation studies; histology of diseased insects: *Unit Virus Res.*

use of viruses in the control of insect pests: *Unit Virus Res.*

electron microscopy of insect viruses: *Unit Virus Res.*

INSECT GROUPS

Aphids

aphids associated with top and soft fruits—systematic and biological studies; control: *E. Malling*

natural control—effects of different environmental conditions on reproduction and feeding capacities of parasites and predators; effects of parasites and predators on aphid populations; effects of insecticides on the parasite-predator-host balance: *N.V.R.S.*

bionomics of various species of Aphididae in the north of Scotland: *N. Scot. Coll.*

factors influencing the spread of aphids within the potato crop: *Nottingham Univ., Dept. of Agric. Sciences* (R.G.)

systematic studies of Aphididae: *Pl. Path. Lab.*

duration of effective flight; vertical distribution in the air: *Rothamsted*

effect of insecticides on populations on field beans of *Aphis fabae* and its parasites and predators: *Rothamsted*

biology of aphids and other possible insect vectors of virus diseases of fruit and potato crops in Scotland: *Scottish Hort. R.I.*

behaviour and ecology of the winged form; nervous interaction of flight and host responses: *Unit Insect Phys.*

colonization in relation to the water supply to the plant: *Unit Insect Phys.*

determination of different forms in aphids: *Unit Insect Phys.*

seasonal and regional fluctuations in aphid populations on potatoes: *W. Scot. Coll.*

Capsids

biology of plant-feeding capsids attacking fruit in Scotland: *Scottish Hort. R.I.*

Chafers

ecology and physiology of the garden chafer; factors controlling abundance and distribution of *Phyllopertha horticola*; mating and egg-laying behaviour; measurement of damage caused in pastures: *Unit Insect Phys.*

Leatherjackets

field studies on autumn and winter populations of leatherjackets: *E. Scot. Coll.*

control of leatherjackets with chlorinated hydrocarbon insecticides as substitutes for Paris Green: *N. Ireland*

ecology and physiology of leatherjackets: *Unit Insect Phys.*

Midges

effect of cultural practices on midge attacks on fruit crops: *Long Ashton*

biology and taxonomy of gall midges of economic importance: *Rothamsted*

White-fly (*Trialeurodes vaporariorum*)

reactions of adult flies to lack of food and changes in quality of food; effects of parathion upon adults and young stages: *Glasshouse Crops*

Wireworms

use of aldrin in control: *N.A.A.S., Advisory Entomologists*

control of wireworms with aldrin: *N. Ireland*

changes in population in relation to different types of leys: *Rothamsted*

MITES

Fruit Tree Red Spider

effects of fungicides and of summer ovicides on populations of the mite and its predators: *E. Malling*

Glasshouse Red Spider

biology and control; tests of acaricides: *Glasshouse Crops*

Various

Typhlodromid spp.; life cycle and determination of species of Laelaptidae; control of various mites on fruit plants: *E. Malling*

C. INSECTICIDES AND FUNGICIDES

Researches in this section are mainly of a chemical or physical nature. Researches by the entomology and plant pathology departments which are directed to the control of specified pests and diseases are indexed in the Crop Index under the crops attacked.

Acaricides

methods for quantitative determination of parathion, chlorinated phenyl benzenesulphonates and other acaricides; penetration of foliage and residues on glasshouse crops: *Glasshouse Crops*

larvicidal properties of acaricides, especially chlorinated phenyl benzenesulphonates, chlorinated anils and oximes and phenylhydrazones of compounds with one or two chlorinated phenyl groups: *Glasshouse Crops*

glasshouse trials of new acaricides applied as dusts and aerosols; phytotoxicity to glasshouse plants: *Glasshouse Crops*

Application

see Dusts, Fumigants, Soil Treatments *and* Spray Application, *below*

Bio-assay of Fungicides

development and improvement of testing methods for fungicides and bactericides, and of methods for culturing test organisms; aided-infection for field tests; plantation trials of new fungicides: *E. Malling*

fungicidal properties of chlorinated salicylanilides; possible penetration of leaves by these compounds: *Glasshouse Crops*

eradicant action of fungicides—effects on mycelial growth and on sporulation, *in vitro* and in the field, with special reference to fungi parasitic on fruit plants: *Long Ashton*

surface-protectant fungicides—spore germination tests, tenacity assays, greenhouse and field trials against diseases of fruit plants: *Long Ashton*

fungicidal performance and phytotoxicity of concentrate sprays: *Long Ashton*

evaluation of fungicides against the grey mould organism, *Botrytis cinerea*: *Scottish Hort. R.I.*

Bio-assay of Insecticides

techniques of bio-assay, including the rearing of test organisms; application in studies of selective toxicity: *E. Malling*

assays of contact insecticides: *Long Ashton*

techniques of continuous mass rearing of test insects and improvement of techniques of biological assessment of toxicity: *Rothamsted*

Botanical Insecticides

active principles of derris and lonchocarpus: *Long Ashton*

isolation and biological assessment of the active principles of pyrethrum flowers; examination of various plant species for insecticidal properties: *Rothamsted*

Chemical Constitution and Activity

relation of chemical structure of organic compounds to their toxicity: *E. Malling*

effect of change of structure on activity of surface protectant fungicides: *Long Ashton*

synthesis and examination of the insecticidal activity of compounds allied to the pyrethrins; studies with the insecticidal amides allied to those found in plants: *Rothamsted*

Dusts

deposition and retention of dust particles on crop surfaces; influence of electrical charges on dust behaviour: *N.I.A.E.*

Effects on Beneficial Insects

effects of plant-protective chemicals on populations of predatory insects and mites: *E. Malling*

toxicity of plant-protective chemicals to bees and other pollinating insects; effect of environmental changes on toxicity: *Rothamsted*

Fumigants

distribution within glasshouses of insecticides etc. applied by alternative methods; relative hazards to workers within the houses and to consumers of treated products: *Glasshouse Crops*

Mechanism of Fungicidal Action

effect of fungicides upon fungus enzymes and upon the respiration of pathogenic fungi: *Long Ashton*

effect of fungal enzymes on phenolic compounds and their derivatives: *Long Ashton*

effect of temperature on the toxicity of fungicides to fungal spores: *Rothamsted*

physiological properties of fungi which determine infectivity: *Rothamsted*

Mechanism of Insecticidal Action

mechanism of action of toxic materials, including synergism and penetration; studies directed toward development of insecticides of high selective toxicity: *E. Malling*

biochemistry of insect blood, and of the insect fat-body: *Leeds Univ., Dept. of Biochemistry* (R.G.)

amino-acid content of insect blood: *London Univ., Univ. Coll., Dept. of Biochemistry* (R.G.)

studies with contact and injection techniques; inhibition of esterases; effects on nervous system as shown by electro-physiological measurements: *Long Ashton*

effect of organo-phosphorus compounds on insect esterases, and the relation between enzyme inhibition and toxicity; isolation and properties of insect esterases; effect of the systemically acting organo-phosphorus compounds on plant esterases: *Rothamsted*

electro-physiological studies on the action of insecticides: *Rothamsted*

absorption, translocation and persistence of certain systemic insecticides in relation to their insecticidal and ovicidal action, using biological tracer techniques; systemic effects with parathion: *Unit Insect Phys.*

mechanism of penetration of insecticides through the cuticle: *Unit Insect Phys.*

Physico-Chemical Studies

physical properties and the performance of sprays; wetting agents; relations between particle size and shape and efficiency of fungicide deposits: *Long Ashton*

studies of droplet formation: *Long Ashton*

action of synergists; physico-chemical factors influencing the toxicity and persistence of insecticides on plants: *Rothamsted*

Resistance of Insects to Insecticides

genetical studies of inherited resistance in *Drosophila*: *John Innes*

mechanism of selection of resistant strains; physiological and biochemical bases of resistance: *Rothamsted*

biological and environmental factors influencing resistance: *Rothamsted*

Soil Treatments

effects of soil insecticides on growth and flavour of subsequent vegetable crops: *Exptl. Hort. Stns., Efford, Luddington, Stockbridge House*

residual effects of soil insecticides on soil fauna and on crop yield and quality; tasting tests for taint; development of a laboratory method for bio-assay of insecticides in soil: *N.V.R.S.*

soil fumigation in forest nurseries: *Rothamsted*

mixing of nematicides with soils; use of radioactive tracers to test efficiency of soil mixing: *W. Scot. Coll.*

Spray Application, Deposits and Residues

low-volume spraying in control of diseases and pests of fruit: *E. Malling*

persistence of spray materials on and in fruit plants: *E. Malling*

determination of residues on or within glasshouse plants; contamination of glasshouse atmosphere with toxic chemicals arising from applications to plants or soil: *Glasshouse Crops*

study of the performance of spraying machines; measurement of run-off and spray drift; effect of formulation on the efficiency of sprays: *Long Ashton*

extent and persistence of spray deposits; determination of deposits in assessment of efficiency of spraying equipment; determination of deposits in comparisons of large and small volume spraying: *Long Ashton*

systems of orchard planting in relation to spraying methods; spray application in relation to host-plant characters—bark, leaf, blossom and fruit; influence of climatic conditions on the efficiency of sprays: *Long Ashton*

effectiveness of wetters in presence of inorganic chemicals: *Pl. Path. Lab.*

determination of plant residues following the use of systemic insecticides: *Pl. Path. Lab.*

evaluation of field hazards in the use of toxic chemicals: *Pl. Path. Lab.*

other references: Physico-Chemical Studies, *above*; Sprayers and Dusters *under* Agricultural Engineering, *page* 105

Spray Damage

testing of spray materials for phytotoxicity; analysis of factors influencing damage, including formulation: *E. Malling*

physiology of spray damage to fruit plants—penetration and action of copper sulphate and other materials: *Res. Inst. Pl. Phys. and E. Malling*

Synthesis

various compounds for testing as toxicants or adjuvants; formulation: *E. Malling*

preparation of chlorinated salicylanilides for trial of fungicidal action against *Cladosporium fulvum*: *Glasshouse Crops*

preparation of phenolic fungicides and their derivatives; 8-hydroxy quinoline derivatives for testing as systemic fungicides: *Long Ashton*

Systemic Fungicides

effects of systemic fungicides on the development of disease and on host and parasite: *Rothamsted*

synthesis of compounds for fungicidal and systemic fungicidal studies; stability of these compounds in plants, plant tissues and fungi; mode of action of systemic fungicides: *Unit Syst. Fung.*

studies on the fungistatic properties of an antibiotic isolated from broad bean (*Vicia faba*): *Unit Syst. Fung.*

Systemic Insecticides

see Mechanism of Insecticidal Action, *above*

D. WEEDS AND WEEDKILLERS

Botany and Ecology of Weed Infestations

identification of weed seeds; distribution of weed seeds and their behaviour in the soil; establishment and reproduction of weeds in seed crops: *N.I.A.B.*

important weeds of vegetable crops—seed production and viability, rate of growth, length of life-cycle, and long-term effects of cultural practices on the viable weed-seed population of the soil; detailed study of factors affecting germination and seedling establishment in the field: *N.V.R.S.*

effect of weeds on growth, yield and quality of vegetable crops; short-term effects of cultivations on weed populations; competition between crops and weeds in the field and, in selected instances, under controlled conditions: *N.V.R.S.*

effects of 5-year fallow cycle on the weed flora of Broadbalk field: *Rothamsted*

effect of irrigation on invasion of weeds (at *Woburn*): *Rothamsted*

identification of weed seedlings in early growth stages: *Unit Exptl. Agron.*

viability of buried weed seeds: *Welsh P.B.S.*

other references: Specific Weeds, *below*

Chemistry and Physiological Action of Herbicides

initial testing of chemicals to evaluate herbicidal efficiency; mode of action of new herbicides on whole plants: *Unit Exptl. Agron.*

synthesis of compounds for studies on relationships between chemical structure and growth-regulating activity; studies of selective toxicity: *Unit Syst. Fung.*

other references: Microbial Decomposition in Soils *under* Microbiology, *page* 26; Growth-Regulating Substances *under* Plant Physiology, *page* 19

Field Control of Weeds

use of selective weedkillers in orchards: *E. Malling*

destruction of weeds by electric discharge; physiological effects of electric currents on plants: *E.R.A.*

effects of hormone weedkillers on grasses and clovers undersown in oats: *E. Scot. Coll.*

long-term effects of repeated applications of various weedkillers (started 1951): *Exptl. Husb. Farm, Bridget's*

use of herbicides in renovating old pastures: *Grassland R.S.*

trials with herbicides in fruit tree nurseries and black currant plantations: *Long Ashton*

numerous experiments indexed under specific crops and under Grassland, *page* 42: *N.A.A.S.*

effects of herbicides and the time of their application on development of seed crops of grasses; varietal differences in susceptibility of cereals to herbicides: *N.I.A.B.*

selective chemical methods of weed control in vegetable crops; field study of promising chemicals; glasshouse testing of newer chemicals: *N.V.R.S.*

trials of selective weedkillers on cereal crops: *N. Ireland*

use of selective weedkillers in cereals and potatoes: *N. Scot. Coll.*

effects of new and established herbicides on field crops and grassland, and on annual and perennial weeds; evaluation of desiccants and defoliants to facilitate harvesting of seeds of clovers and poppy; development of application equipment for spraying experimental plots; logarithmic dilution sprayer: *Unit Exptl. Agron.*

effects of selective weedkillers on white clover; evaluation of weedkillers in S.W. Scotland: *W. Scot. Coll.*

other references: specific crops in Crop Index; Grassland, *page* 42

Specific Weeds, Biology and Control

bracken

experiments in killing bracken by electric discharge: *E.R.A.*

bracken survey (*Lephinmore* and *Sourhope*): *Hill Farm. R.O.*

economic study of cutting and bruising as means of control; mechanical means of controlling spread: *N.I.A.E.* (*Scot.*) (in conjunction with *E.* and *W. Scot. Colleges*)

enzymic composition of bracken at different stages of growth: *Rothamsted*

physiology of bracken rhizome; mechanical control of bracken and subsequent husbandry of treated areas: *W. Scot. Coll.*

broomrape

study of the spread and control of broomrape in field experiments with clover: *Welsh P.B.S.*

dock

control of docks in grassland: *Hannah*

control of docks in leys by spraying: *N.A.A.S., Provincial Centres* (in collaboration with *Unit Exptl. Agron.*)

biology of *Rumex* spp.: *Unit Exptl. Agron.*

eradication of docks by weedkillers: *W. Scot. Coll.*

ragwort

rates and times of spray application for control: *N.A.A.S., Provincial Centres* (in collaboration with *Unit Exptl. Agron.*)

effects of cutting treatments: *N.A.A.S., Wales*

rushes

spraying experiments: *N.A.A.S., Provincial Centres* (in collaboration with *Unit Exptl. Agron.*)

control of rushes by 2,4-D: *N.A.A.S., South Western Province*

control in grassland by various methods: *N. Scot. Coll.*

thistle

control of creeping thistle in grassland: *N.A.A.S., Provincial Centres* (in collaboration with *Unit Exptl. Agron.*)

control by spraying: *N.A.A.S., Northern Province*

wild oats

survival of wild oats under leys: *Exptl. Husb. Farm, Boxworth*

biology of wild oats (*Avena fatua* and *ludoviciana*); germination and dormancy of seeds; field experiments in control: *Rothamsted*

wild onion

control of wild onion in pasture by maleic hydrazide: *N.A.A.S., East Midland Province* (in collaboration with *Unit. Exptl. Agron.*)

BEES

Behaviour of the Honeybee

age groups feeding the queen; relations within the overwintering colony; factors predisposing to successful wintering: *N. Scot. Coll.*

colony organization; methods of communication between members of a colony; role of 'queen substance' in organization; foraging behaviour; other aspects of bee behaviour; *Rothamsted*

Breeding

comparison of longevity, temper and behaviour of bees of various strains: *Rothamsted*

Diseases

fumigation against acarine disease; use of terramycin against American and European Foul Brood: *E. Scot. Coll.*

control of Nosema and of acarine disease: *N. Ireland and N. Scot. Coll.*

control of acarine disease and Amoeba disease: *Rothamsted*

brood diseases—studies on the transmission of European Foul Brood and on the causative organism; trials with Toumanoff's vaccine against American Foul Brood: *Rothamsted*

Effects of Plant Protective Chemicals on Bees

toxicity of plant protective chemicals to bees; effect of environmental changes on toxicity: *Rothamsted*

Honey

pollen analysis of honey; various quality factors: *N. Scot. Coll.*

Management

wintering experiments; swarm control; migratory beekeeping: *N. Scot. Coll.*

wintering and other problems of management; the role of 'queen substance' in queen introduction and various problems of practical beekeeping: *Rothamsted*

Nectar Secretion

phenology of flowering plants with reference to honey yields: *N. Scot. Coll.*

nectar yield of strains of red clover in relation to pollination: *Rothamsted*

Pollination

methods of directing honeybees to particular crops that require pollination; use of honeybees as pollinators of brassica seed crops: *Rothamsted*, (in collaboration with *N.V.R.S.*)

Wax Extraction

wax extraction from old comb: *Rothamsted*

PLANT PRODUCTS

Research on plant products normally does not fall within the province of the Agricultural Research Institutes. Exceptions are herbage products (indexed under Grassland—conservation of Herbage) and some fruit products entered below.

Apple Juice and Cider

composition of apples and their juices as affected by variety, site effects and fruit maturity: *Long Ashton*

extraction of juice and its treatment for cider-making and for unfermented products: *Long Ashton*

treatment of pomace for the manufacture of pectin: *Long Ashton*

chemical and factory investigations of fermentation: *Long Ashton*

microbiology of cider-making (*see* Microbiology, *page* 24): *Long Ashton*

Apple Juice Concentrates

effects of concentration and pre-concentration treatments on chemical components and enzyme systems of juices: *Long Ashton*

Domestic Methods of Food Preservation

deep freezing—quality of products preserved by deep freezing; microbiological studies of frozen foods; suitability of containers or wrapping material: *Long Ashton*

heat penetration of containers in relation to microbiological problems in the bottling and canning of meat, poultry, vegetables and tomatoes: *Long Ashton*

effects of pressure cooking on pectins and vitamins: *Long Ashton*

preparation of fruit drinks; factors affecting quality of home-made wines: *Long Ashton*

fruit and vegetable variety trials in relation to quality after bottling or canning: *Long Ashton*

Juices of Soft Fruits

composition of fruits and juices as affected by variety, site and manuring, with special reference to factors influencing ascorbic acid content: *Long Ashton*

juice concentration; factors affecting quality of concentrates: *Long Ashton*

Perry

survey of problems of perry-making—vintage trials of pear varieties; factors affecting processing; studies of organic acids and phenolic components of pear juices: *Long Ashton*

GRASSLAND AND HERBAGE

The range of subjects included in this section is so wide that the selection of entries has had to be arbitrary. The aim has been to include that work on production and utilization of herbage which is of most direct interest to the grassland agronomist.

Breeding of Grasses and Herbage Plants

see Clover, Grasses, *and* Lucerne *in* Crop Index; *and* Strain Trials, *below*

Chemistry of Herbage Plants

magnesium in grassland species: *E. Scot. Coll.*

spectrographic analysis of herbage samples for micro-elements: *E. Scot. Coll.*

carbohydrates in grass and silage: *Edinburgh Univ., Dept. of Chemistry* (R.G.)

fractionation of proteins in leaves; micro-elements in herbage; analytical methods for polysaccharide and lignin analysis; digestibility studies; study of factors in herbage which may cause scouring: *Grassland R.S.*

chemistry of grasses and legumes with special reference to the carbohydrate content at different stages of growth and at different times of the year: *Hannah*

herbage analysis for micro-elements: *Macaulay*

chemical constitution of some lucerne strains: *N.I.A.B.*

chemical composition of pure stands of grasses, with particular reference to nitrogenous manuring and stage of maturity: *N. Ireland*

nature of non-protein nitrogenous substances in grass; procedures for extraction of protein from leaves: *Rowett*

state of combination of copper in pastures: *Rowett*

biochemical and nutritive properties of herbage: *Univ. Coll. N. Wales, Dept. of Agric. Chemistry* (R.G.)

other references: Feeding Values, *below*

Conservation of Herbage

drying

relative merits of grass-drying and silage making: *Hannah*

ensilage

practical problems of silage-making—partial wilting of grass crops for silage; bacteriology and chemistry of silage—effects of temperature, moisture, chopping of herbage, inoculation and sodium metabisulphite on the over-all fermentations and on the main groups of silage bacteria; analysis of lactic and volatile fatty acids present: *Edinburgh Univ., Depts. of Agriculture and Chemistry and E. Scot. Coll.* (R.G.)

comparison of quality of silage made from wilted and non-wilted material: *Exptl. Husb. Farm, Gleadthorpe*

value of sodium metabisulphite in making silage: *N.A.A.S., Nutrition Chemists*

problems of removal of silage from pits; cutting devices; observations on systems of self-feeding: *N.I.A.E. (Scot.)*

silage making; effect of temperature on quality; use of metabisulphite; effect of leaching; poisonous weeds in silage; ensiling of brewers' grains; baled silage; chemical composition: *N.I.R.D.*

study of conservation losses in grass silage made by the addition of chemical agents, including sodium metabisulphite: *N. Ireland*

types of grass silage, and methods of use, for the winter fattening of bullocks: *N. Ireland*

ensilage of green oats; losses in silage-making; use of sodium metabisulphite: *N. Scot. Coll.*

techniques of making and handling silage: *W. Scot. Coll.*

other references: Bacteriology of Silage *under* Microbiology, *page* 25

haymaking

factors affecting quality of baled hay; management of hay fields: *Exptl. Husb. Farm, Trawscoed*

design of various types of tripod and rack; techniques of loading; keeping quality of bales made by various types of baler; study of different types of haymaking machine: *N.I.A.E.*

problems of mechanizing rick (pike) and tripod methods of haymaking: *N.I.A.E. Scot.*

effect of baling and frame drying on losses: *N.I.R.D.*

protein extraction
biochemical aspects of leaf protein extraction; large-scale preparation of leaf protein: *Rothamsted*

procedures for extraction of protein from leaves: *Rowett*

Diseases of Herbage Plants
see Crop Index (Clover, Grasses, Lucerne)

Ecology
relationship of plant distribution in hill pasture to soil factors: *E. Scot. Coll.*

effects of animal excreta on production and composition of pasture: *E. Scot. Coll.*

influence on botanical composition of old pastures of manuring, seeding, herbicides, and management: *Grassland R.S.*

interactions of defoliation and competition for light influencing morphology of plants in pasture: *Grassland R.S.*

ecological survey of vegetation and soil types: *Hill Farm. R.O.*

effects of drainage on hill vegetation: *Hill Farm. R.O.*

re-establishment of heather after burning: *Hill Farm. R.O.*

relationship of *Nardus* and other plant communities: *Hill Farm. R.O.*

effect of shelter belts on vegetation: *Hill Farm. R.O.*

effect on vegetation of mixed cattle and sheep grazing compared with sheep alone: *Hill Farm. R.O.*

ecological studies of heather and moorland communities: *Macaulay*, (in collaboration with *Hill Farm. R.O.*)

effect of soil potassium level on the ability of clovers to compete with grasses in the sward: *N. Ireland*

effect of drainage on botanical composition of a draw-moss moor: *N. Scot. Coll.*

genetical-ecological study of hill and moorland vegetation: *Scot. P.B.S.*

plant types surviving at different intervals of time in a sown ley: *Welsh P.B.S.*

comparative study of plant behaviour under lowland and upland conditions, including response of plants and strains to fertilizers: *Welsh P.B.S.*

other references: Hill Pasture Improvement, *below*

Experimentation
design of animal experiments: *Grassland R.S.*

layout of animal experiments and efficiency of techniques; pasture evaluation in terms of animal products: *N.I.R.D.*

technique of experiments on the grazing animal, particularly the estimation of herbage consumption: *Rowett*

technique of grassland experiments; sampling methods, variation between samples; number, shape and size of sampling unit in relation to different grazing managements: *Welsh P.B.S.*

Feeding Values

comparison of high-clover with low-clover high-nitrogen swards; comparison of ryegrass, cocksfoot and meadow fescue: *N.I.R.D.*

relation between pasture composition and animal production and performance, using dairy cattle, grazing and housed in metabolism stalls: *Rowett*

other references: Chemistry of Herbage Plants, *above*

Grazing Management and Animal Production

comparison of growth of beef cattle on lucerne and cocksfoot leys; herbage intake and grazing behaviour; fattening potential of lucerne and cocksfoot at two levels of nitrogenous manuring: *Grassland R.S.*

effect of nitrogen at different levels and different seasons on animal production and grassland output: *Grassland R.S.*

nature of the check in liveweight gain in cattle turned on to spring grass after various winter managements: *Grassland R.S.*

management of sward for fat lamb production; length of herbage for sheep grazing: *Grassland R.S.*

comparison of strip and free grazing on swards that contain clover and on swards receiving heavy fertilizer treatments: *Hannah*

comparison of extensive grazing and close folding: *Hannah*

relation of grassland management to hypomagnesaemia, to grass tetany, and to other metabolic disorders: *N.I.R.D.*

estimation of the food intake of sheep and cattle by external indicator and faecal index methods: *N. Ireland*

management as a factor in determining composition and production of grassland: *Welsh P.B.S.*

other references: Feeding Values, *above*; Herbage Production, *below*; Strain Trials, *below*; Winter Feeding Problems, *below*

Hay

see Conservation of Herbage, *above*

Heather

see Ecology, *above*

Herbage Production

effect of manurial treatment on yield and composition of grassland cut five times a year; grass seeds mixtures for silage; simple seeds mixtures; effect of white clover seed rates: *E. Scot. Coll.*

effects of treatments with nitrogen and magnesium compounds: *E. Scot. Coll.*

comparison of seeds mixtures; improvement of permanent grass: *Exptl. Husb. Farm, Great House*

liming experiments; comparison of forms of nitrogen; most suitable types of phosphates for permanent grass; optimum time to apply farmyard manure, and its interactions with inorganic fertilizers: *Exptl. Husb. Farm, Great House*

comparison of autumn and spring applications of fertilizers to permanent meadows grazed by sheep in spring: *Exptl. Husb. Farm, Great House*

effects of late application of nitrogen to grass cut for silage: *Exptl. Husb. Farm, Trawscoed*

autumn management for early bite; level of nitrogenous manuring in autumn and spring: *Grassland R.S.*

estimation of nitrogen fixed by legumes in the sward: *Grassland R.S.*

long-term effects of liberal fertilizer treatment on paddocks cut 4–5 times a year for grass-drying: *Hannah*

long-term comparison of the effects on yield, per acre and per cow, of high and low fertilizer treatment of pasture: *Hannah*

long-term effects of nitrogen, phosphorus and potassium on grassland production and on botanical composition of the sward: *Hannah*

effect of companion grass and clover strains on production from grass-clover swards: *Hannah*

effect of cutting management and time of nitrogen application on production from grass-clover swards: *Hannah*

intensive grass production to provide complementary grazing in spring and autumn and hay and silage for winter feeding of the outwintered herd: *Hill Farm. R.O.*

seeds mixtures for various purposes and for different soils: *N.A.A.S., Wales*

seeds mixtures for a heavy land area: *N.A.A.S., South Western Province*

various manurial experiments on permanent grassland and on leys: *N.A.A.S., Provincial Centres*

value of gas liquor as a source of nitrogen: *N.A.A.S., Advisory Soil Chemists*

measurement of pasture output in swards under various systems of seeding, manuring and grazing management: *N. Ireland*

comparison of yields from swards mainly dependent on artificial fertilizers and from similar swards mainly dependent on white clover as sources of nutrient nitrogen: *N. Ireland*

relationship between level of nitrogen application and species dominance and yield in mixed grass and clover swards cut four times annually: *N. Ireland*

interactions of strains and manurial levels in production of Italian ryegrass: *N. Ireland*

comparison of mixtures for silage or forage: *N. Scot. Coll.*

seeds mixtures, manuring, and management for autumn grazing: *N. Scot. Coll.*

effect of nurse crops on performance of undersown swards: *N. Scot. Coll.*

effect of nitrogen on grass-clover swards in relation to time of application: *N. Scot. Coll.*

effect of various forms of phosphate on a 3-year ley: *N. Scot. Coll.*

comparison of various nitrogenous manures on grassland: *Rothamsted*

interaction and value of blending certain species and strains as opposed to their use in simple one-grass-one-clover mixtures: *Welsh P.B.S.*

effects on productivity and botanical composition of swards of various systems of grazing and management: *Welsh P.B.S.*

relative efficiency of different species and strains of herbage plants in utilization of fertilizer: *Welsh P.B.S.*

grazing trials of various mixtures: *W. Scot. Coll.*

other references: Strain Trials, *below*

Hill Pasture Improvement

manuring of hill lands and reseeding of hill areas: *Hill Farm. R.O.* (in collaboration with *N. Scot. Coll.*)

problems of hill drainage: *Hill Farm. R.O.*

micro-element problems of hill lands: *Macaulay*

effects of lime and phosphate: *N.A.A.S., Provincial Centres*

cultural and manurial problems; response to light dressings of lime and phosphate; use of 'pioneer' species in hill reclamation; seeds mixtures for hill land: *N. Scot. Coll.*

reaction of natural hill pastures to fertilizer, lime, and other treatments; behaviour of grass and clover strains under hill conditions; stock production of natural and improved hill swards: *Welsh P.B.S.*

improvement by manurial (including micro-element) treatment and surface sowing: *W. Scot. Coll.*

re-seeding of peaty areas: *W. Scot. Coll.*

other references: Ecology, *above*

Irrigation

see Crop Husbandry, *page* 14

Leys, Effect on Soil Fertility

see Soils under Sward, *below*

Manuring
see Herbage Production, *above*

Pigs on Grassland
see Pigs *in* Animal Index, *page* 119

Poultry on Grassland
see Poultry *in* Animal Index, *page* 122

Quality of Herbage
see Chemistry of Herbage Plants, *above*; *and* Feeding Values, *above*

Root Studies
effects of species, nitrogenous fertilizers, and frequency of cutting and grazing of leys on herbage yields and quantitative development of the root mass: *Grassland R.S.*

seasonal variation in numbers of new root initials from the tiller bases of perennial ryegrass and white clover: *Grassland R.S.*

effect of autumn and winter management of swards on root development and the content of soluble carbohydrates in roots and tiller bases: *Grassland R.S.*

physiological studies of the roots of herbage plants: *Grassland R.S.*

root development of herbage plants and its effect on soil structure and fertility; influence of environment on relationship between growth of root and growth of shoot: *Welsh P.B.S.*

other references: Soils under Sward, *below*

Seed Mixtures
see Herbage Production, *above*

Seed Production of Herbage Plants
manuring and management of grasses for seed production; pre-harvest defoliants for lucerne; pest damage assessment in red clover: *Grassland R.S.*

effect of phosphate and potash on yield of red clover seed: *N.A.A.S., Wales*

management of herbage seed crops: *N.A.A.S., East Midland Province*

seed setting in lucerne and red clover; techniques of seed production: *N.I.A.B.*

problems of harvesting clover and grass seeds: *N.I.A.E.*

measurement of homogeneity in commercial bulks of ryegrass seed; longevity of ryegrass seed under commercial storage conditions; international uniformity trials in seed-testing technique: *N. Ireland*

effects of environmental factors on flowering and seed production of herbage plants: *Welsh P.B.S.*

vegetative propagation of grasses and white clover for seed production purposes: *Welsh P.B.S.*

factors affecting viability of herbage seeds in storage: *Welsh P.B.S.*

Silage

see Conservation, *above*

Soils under Sward

effects of various leys and seed crops on soil fertility as measured by subsequent arable crops: *Grassland R.S.*

pot tests of response of test crops to grassland soils taken from plots subject to various managements: *Grassland R.S.*

changes in water-stable aggregates and soil porosity under swards as influenced by plant species, management and utilization; changes in soil organic carbon; total nitrogen status of soil; production of nitrate and ammoniacal nitrogen and carbon dioxide under swards receiving various experimental treatments: *Grassland R.S.*

influence of grass strains, subjected to different manuring and systems of management, on soil fertility as measured by subsequent arable crops: *Welsh P.B.S.*

other references: Rotation Experiments *under* Crop Husbandry, *page* 14; Soil Management in Orchards *under* Top Fruit *in* Crop Index, *page* 183

Strain Trials

annual and seasonal productivity of strains of timothy: *E. Scot. Coll.*

suitability of strains for giving early spring growth: *Exptl. Husb. Farm, Trawscoed*

observational trials of new or recently introduced strains of herbage plants; sward trials of grasses, lucerne and clovers: *Grassland R.S.*

identification studies of grass, clover and lucerne strains; classification, registration and preliminary assessment of strains of herbage plants: *N.I.A.B.*

strain trials of cocksfoot, meadow fescue, perennial ryegrass, timothy, red clovers, lupins and miscellaneous herbage plants: *N.I.A.B.*

field trials of strains and agrotypes of perennial ryegrass, as single plants and as pure and mixed swards: *N. Ireland*

strain potentiality trials with cocksfoot, timothy and fescues: *N. Scot. Coll.*

preliminary trials of new or recently introduced strains of herbage plants for establishment, persistency and agronomic behaviour: *Welsh P.B.S.*

herbage production trials under various systems of management: *Welsh P.B.S.*

comparison of strains in terms of animal products: *Welsh P.B.S.*

behaviour and performance of potential new strains at centres distributed over England and Wales: *Welsh P.B.S.* (in collaboration with *N.A.A.S.*)

potentiality trials of grass and clover species and strains: *W. Scot. Coll.*

Weed Control in Pastures

trials of growth-regulating weedkillers: *E. Scot. Coll.*

control of grassland weeds, especially docks: *Hannah*

control of rushes by 2,4-D: *N.A.A.S., South Western Province*

effect of cutting on ragwort: *N.A.A.S., Wales*

control of thistle by spraying: *N.A.A.S., Northern Province*

effect of selective herbicides on a mowing ley: *N.A.A.S., South Western Province*

various experiments: *N.A.A.S., Provincial Centres* (in collaboration with *Unit Exptl. Agron.*)

control of ragwort in grassland: *N. Ireland*

effects of different herbicides on an undersown sward: *N. Scot. Coll.*

chemical control of weeds in permanent pastures and in leys: *Unit Exptl. Agron.* (in collaboration with *Grassland R.S.* and *N.A.A.S.*)

Weed Control in Seed Crops

effects of selective weedkillers on legumes; control of grasses in lucerne: *Grassland R.S.*

effect of herbicides on grass seed crops; chemical eradication of blackgrass; comparisons of MCPA and MCPB on clover seed crops: *N.I.A.B.*

chemical control of annual grass weeds in grass seed crops: *Unit Exptl. Agron.* (in collaboration with *N.A.A.S.* and *N.I.A.B.*)

Winter Feeding Problems

comparison of grasses for their suitability for production of winter grass: *Exptl. Husb. Farm, Trawscoed*

management of grass for winter foggage and early bite: *Exptl. Husb. Farm, Liscombe* (in collaboration with *Grassland R.S.*)

production of winter grass—species and mixtures for winter grazing; management and manuring of cocksfoot and lucerne in alternate rows: *Grassland R.S.*

winter grazing for beef stores; attempts to winter yearling cattle on grass with or without supplementary feeding: *Grassland R.S.*

levels of feeding and the value of winter grass for feeding the in-lamb ewe: *Grassland R.S.*

kales and rapes for winter feed: *Grassland R.S.*

comparison of different species of grass cut in spring and autumn and fed as dried grass: *Hannah*

level of supplementary feed required for milk production when fed in addition to dried grass, silage, or hay: *Hannah*

self-feeding of silage to outwintered heifers: *Hannah*

intensive grass production to provide complementary grazing in spring and autumn and hay and silage for winter feeding of the outwintered herd: *Hill Farm. R.O.*

species and strains of grass and clover for producing winter fodder: *Hill Farm. R.O.*

autumn management and nitrogen manuring of grass for early bite; conservation of winter foggage: *N.A.A.S., Grassland Officers* (in collaboration with *Grassland R.S.*)

techniques of grassland production and conservation in the Highlands to ease the problems of winter feeding: *N. Scot. Coll.*

winter grazing of beef store cattle; production of grass for winter grazing: *Rowett*

ANIMAL MANAGEMENT AND HUSBANDRY AND HOUSING

This section covers work on management, feeding and housing. A large amount of work with a bearing on these problems is listed in other sections.

Feeding Practice

general

behaviour of herbivorous animals; free choice selection of mineral substances by cattle: *Compton*

feeding of pullets—effect of different methods on initial egg production: *Exptl. Husb. Farm, Trawscoed*

the efficiency of a protein concentrate pellet (at 10 %) in a diet of mixed whole grains: *N. Ireland*

nutrition of ewes rearing two crops of lambs per annum: *Rowett*

studies of the effect of diet during growth on the permanent dentition and supporting structures of sheep: *Rowett*

investigations of the nutrition of sows during growth and lactation: *Rowett*

indoor and outdoor feeding of store and fattening cattle: *Rowett*

the relationship between growth of cattle under different managements and types of feeding and the different dietary constituents fed them: *Rowett*

antibiotic supplements

growth-promoting effects of antibiotic substances—experiments with pigs, calves and foals: *Compton*

techniques for assay of antibiotics in body fluids, digestive tract, and feeding stuffs: *Compton*

the nature of the 'infection' counteracted by penicillin; the significance of inactivated penicillin: *N.I.R.D.*

influence of diet on health, growth and development of calves; effect of antibiotics: *N.I.R.D.* (in collaboration with *Royal Veterinary Coll.*)

growth-promoting effects in pigs of antibiotic substances; interaction of antibiotics: *N. Ireland*

effect of antibiotics on growth rates in calves: *N. Ireland*

food additives other than antibiotics

copper as food additive in rations for pigs: *N.I.R.D.*

effect of high levels of copper salts in the food on growth and carcass quality in pigs: *N. Ireland*

effect of endocrine substances on growth and carcass conformation in pigs: *N. Ireland*

investigation of growth stimulants for pigs: *Rowett*

plane of nutrition

comparison of production of milk from and duration of milking life of cows reared on different planes of nutrition: *Exptl. Husb. Farms, Boxworth, Bridget's, Trawscoed*

the effect of level of supplementary feed for milk production when fed in addition to dried grass, silage and hay: *Hannah*

high and low energy diets in relation to growth rates in calves: *N. Ireland*

high and low energy diets in relation to growth and carcass quality in pigs: *N. Ireland*

the influence of energy levels, in battery hens' diet, on food conversion: *N. Ireland*

the effect of the plane of nutrition of the dam on the growth rate of calves: *Rowett*

the effects of varying planes of nutrition during the rearing period on the growth, yield and health of dairy cattle: *Rowett*

effect on lamb growth of level of feeding of ewes over different periods before and after lambing: *Rowett*

effect of level of nutrition in early life on dental history of breeding ewes: *Rowett*

winter feeding (cattle)

study of the progress of steers outwintered on foggage: *Exptl. Husb. Farm, Gleadthorpe*

value of winter grazing for beef stores: *Grassland R.S.*

the influence of winter feeds on milk composition; further work on the factors affecting the solids-not-fat content of milk: *Hannah*

self-feeding of silage to outwintered heifers: *Hannah*

winter feeding of dairy cows with different species of grass cut in spring and autumn: *Hannah*

intensive grass production to provide complementary grazing in spring and autumn and hay and silage for winter feeding of the outwintered herd: *Hill Farm. R.O.*

types of grass silage, and methods of use, for the winter fattening of bullocks: *N. Ireland*

winter feeding (sheep)

the effect of various methods of wintering Gimmer Hoggs on growth, vigour and future breeding qualities: *Exptl. Husb. Farm, Great House*

use of foggage for wintering hill ewe lambs: *Exptl. Husb. Farm, Great House*

effects of levels of feeding and the value of winter grass in feeding the ewe during the latter half of pregnancy: *Grassland R.S.*

nutrition of ewes in winter: *Hill Farm. R.O.*

miscellaneous feedingstuffs

the value of soiling grass for milk production: *E. Scot. Coll.*

the use of Brassica crops for feeding store wether lambs: *Exptl. Husb. Farm, Rosemaund*

conditions under which fodder roots may be safely fed to tegs: *Exptl. Husb. Farm, Rosemaund*

the growth of calves when whole milk is largely replaced by milk substitute gruels: *Exptl. Husb. Farms, Boxworth, Bridget's, Trawscoed*

the feeding of home-grown bulky foods to dairy cows in winter; can calves reared on a bulky diet make better use of bulky feeding stuffs?: *Exptl. Husb. Farm, Great House*

the effects of level of nutrient intake and composition of the ration upon milk yield and quality: *Exptl. Husb. Farm, Bridget's* (in collaboration with *N.I.R.D.*)

effect of silage on milk composition: *N.I.R.D.*

the optimum stage for cutting green oats for silage for maximum yield, judged by fattening of cattle: *N. Scot. Coll.*

the value of the main cereal grains, oats, wheat, barley and maize in the rearing and fattening diets of turkeys: *N. Scot. Coll.*

comparison of different root crops and methods of management for fattening lambs: *Rowett*

feeding value of silage and other fodders for beef production: *Rowett*

the economical use of home-produced feeds for pigs under different methods of husbandry: *Rowett*

Grazing and Grassland Management

general

effect of applications of nitrogen fertilizer at different levels and different seasons on animal production and grassland output: *Grassland R.S.*

comparison of fattening potential, particularly in autumn and early winter, of lucerne and cocksfoot in alternate drills and in adjacent areas at two levels of nitrogenous application: *Grassland R.S.*

comparison of production from lucerne and cocksfoot leys; measurement of herbage intake: *Grassland R.S.*

comparison of very restricted and lax grazing: *Hannah*

pasture evaluation in animal terms; principles and techniques in relation to economical use of large animals; variability studies: *N.I.R.D.*

grazing of mixed sheep and cattle

mixed grazing of cattle and sheep *v.* single stocking: *Exptl. Husb. Farm*

output of beef and mutton under normal grazing management: *Exptl. Husb. Farm*

effect on vegetation of mixed cattle and sheep grazing compared with sheep alone: *Hill Farm. R.O.*

effects of cattle grazing on sheep stock: *Hill Farm. R.O.*

grazing of cattle

comparison of different methods of turning out calves on to pasture in the spring: *Exptl. Husb. Farms, Boxworth, Bridget's, Trawscoed*

effect of varying levels of nitro-chalk on yield and composition of sward and effect of feeding carbohydrate supplement to dairy cows at grass: *Exptl. Husb. Farm, Bridget's* (in collaboration with *N.I.R.D.*)

output of milk from grass alone: *Exptl. Husb. Farm*

investigation of the check in liveweight gain in cattle on spring grass following wintering in yards and outwintering: *Grassland R.S.*

a study of intensive grassland problems with the aim of obtaining high output per cow: *Hannah*

the extent to which roughages can replace concentrates: raising calves on grass: *N.I.R.D.*

the extension of the grazing season for store cattle: *Rowett*

grazing of pigs

effect of pig grazing on the persistency of lucerne, white clover, perennial ryegrass, timothy and meadow fescue, and the saving of meal that can be obtained by grazing cows and growing pigs: *Grassland R.S.*

grazing of poultry

effect of systems of poultry management on the clover content of a mixed sward; effects of systems of management on the botanical composition and palatability of swards sown to one or two species: *Grassland R.S.*

grazing of sheep

feeding of grass and grass products to sheep: *E. Scot. Coll.*

relationship between pasture condition and nutrition of the lamb: *Grassland R.S.*

management of the sward for fat lamb production; length of herbage for sheep grazing: *Grassland R.S.*

grazing behaviour of hill sheep: *Hill Farm. R.O.*

influence of intensity of sheep stocking of pastures: *W. Scot. Coll.*

Housing

investigation into systems of cattle housing: *E. Scot. Coll.*

the effect of temperature control in deep-litter houses: *Exptl. Husb. Farm, Great House*

assessment of the correlation between the behaviour of the pig and its environment: *Harper Adams*

the cost structure of egg production under various systems of intensive and extensive housing: *Harper Adams*

the cost of brooding and rearing pullets in autumn and spring under intensive and extensive conditions: *Harper Adams*

the cost of producing broiler chicks under intensive and extensive systems of housing: *Harper Adams*

the cost of producing turkeys, brooded and reared under intensive and extensive systems of housing: *Harper Adams*

effects of continuous breeding under intensive conditions of housing: *N. Ireland*

environmental studies of pigs: *N. Ireland*

Management

cattle

calf management studies: various methods of rearing, indoors and outside on pasture: *Grassland R.S.*

the maintenance of a mastitis-free herd: *Hannah*

comparison of Highland with Galloway cows and their calves by a Shorthorn bull and of Highland × Shorthorn with Galloway × Shorthorn cows and their calves by an Aberdeen Angus bull: *Hill Farm. R.O.*

a comparison of different breeds for producing beef from the hills: *N. Scot. Coll.*

pigs

the relationship of the feeding and management of sows to the health and survival rate of litters: *Glasgow Univ., Vet. School* (R.G.)

effect of restricted water on daily liveweight increase and food conversion of pigs: *Harper Adams*

a study of methods for the establishment of a virus-pneumonia-free herd: *Harper Adams*

a comparison of indoor-outdoor farrowing: *Harper Adams*

labour saving in pig feeding; scales of feeding; water requirements; use of dairy by-products; mode of action of antibiotics in food: *N.I.R.D.*

artificial rearing of baby pigs; value of creep meal for suckling pigs; requirements for vitamins and inter-relationship between nutrients: *N.I.R.D.*

dietary studies in relation to the artificial rearing of pigs: *N. Ireland*

interactions of heredity and environment in the fattening and carcass quality of bacon pigs: *N. Ireland*

relationship between growth rates at various ages and the carcass quality of bacon pigs: *N. Ireland*

problems associated with the weaning of baby pigs from the sow at an early age: *Rowett*

aseptic farrowing to produce stock free from atrophic rhinitis, virus pneumonia, etc.: *Weybridge*

poultry

influence of temperature and lighting in chick brooding: *E.R.A.*

optimum relative humidity for the brooding of chicks: *E.R.A.*

length and timing of flashes for optimum winter egg production for birds in cages and in folds: *E.R.A.*

the value of flash lighting and dull red lighting on egg production in comparison with normal lighting: *E.R.A.*

comparison of different methods of management for egg production: *Exptl. Husb. Farm, Trawscoed*

incubator hygiene: fumigation with furfural and formalin; estimation of bacterial populations in incubator rooms: *Lasswade*

the effect of incubator practice on hatching percentage: *Reading Univ.*

the effect of light and nutrition on the occurrence of sexual maturity and onset of lay in pullets: *Reading Univ.*

the effect of light, nutrition and breed on growth and feed efficiency of young birds to table weight: *Reading Univ.*

the nature of the production pattern in laying birds and its influence by age of maturity, season of hatch and nutrition: *Reading Univ.*

studies on the husbandry of the caged bird: *Reading Univ., Dept. of Agriculture* (R.G.)

breeding, management and feeding in relation to poultry production: *W. Scot. Coll.*

sheep

adaptation to environment and hardiness in hill sheep: *A.B.R.O.*

limits to intensive stocking with sheep: *Exptl. Husb. Farm, Bridget's*

effect of afforestation on the sheep flock and its behaviour: *Hill Farm. R.O.*

wintering of ewe hoggs: *Hill Farm. R.O.*

fattening ability of hill lambs; quality of carcass: *Hill Farm. R.O.*

General

farm management; the establishment of input-output standards for the critical examination of the farm as a business: *E. Scot. Coll.*

the problem of livestock marketing in South East Scotland; war-time, post-war and present-day developments: *E. Scot. Coll.*

time and motion studies in agriculture: *E. Scot. Coll.*

studies of farm organization; application of partial and total budgetary analysis: *N. Scot. Coll.*

ANIMAL BREEDING AND GENETICS

Investigations on reproduction will be found under Animal Physiology, while infertility is referred to under Animal Pathology.

Breed and Strain Characters

performance of Tasmanian Merino sheep in Scotland: *A.B.R.O.*

relative meat, milk and wool characters of Blackface and Swaledale sheep and their crosses: *A.B.R.O.*

estimation of genetic parameters in Blackface sheep: *A.B.R.O.*

relationship of breeds and crosses to carcass quality of beef: *Cambridge Univ., School of Agriculture* (R.G.)

breeding of auto-sexing poultry; Brussbars; susceptibility of different breeds to scrapie: *Compton*

comparison of post-natal growth of mammary glands in different strains of mice: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

breeds and crosses for beef production: *Exptl. Husb. Farms, High Mowthorpe, Rosemaund*

observations on suitability as breeding stock on hill farms of Highland and Highland cross cows: *Hill Farm. R.O.* (in collaboration with *A.B.R.O.*)

comparison of North and South Country Cheviots; of Lanark, Lewis, Newton Stewart and Home-bred types of Blackface; and of Lanark, Lewis and Newton Stewart rams: *Hill Farm. R.O.*

incidence of scrapie within a breed: *Moredun* (in collaboration with *A.B.R.O.*)

Congenital Effects

congenital infection with Johne's disease: *Glasgow Univ., Veterinary School* (R.G.)

determination of whether congenital infection occurs in scrapie: *Moredun* (in collaboration with *Compton*)

Cytological Genetics

theoretical studies of gene action: *A.B.R.O.*

the study of fertilization, parthenogenesis and polyploidy in mammals: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

extrachromosomal influences in development and heredity: *London Univ., Royal Veterinary Coll.* (R.G.)

inheritance mechanisms of protozoa: *London Univ., University Coll.* (R.G.)

Inheritance of Abnormalities

incidence and inheritance of abnormalities when inbreeding, outbreeding or crossing Large White and Wessex Saddleback pigs: *A.B.R.O.*

incidence of cryptorchids in the progeny of a cryptorchid bull: *A.B.R.O.*

breeding to determine frequency of *Hydrops foetalis* in a pedigree herd: *Compton*

investigation of hereditary factors associated with curled tongue in poultry: *Lasswade*

inheritance of tumours in poultry: *N. Ireland*

cerebrellar hypoplasia of genetical origin in poultry: *Weybridge* (in collaboration with *A.B.R.O.*)

Inheritance of General Characters

general

genetic differences between spermatozoa: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

cattle

genetic differences between bull breeding herds: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

genetics of beef and milk production in dual purpose cattle: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

compatibility of milk and beef; analysis of data from Danish testing stations: *Edinburgh Univ., Dept. of Animal Genetics* (B.G).

inheritance of dairy characteristics in British breeds: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

correlation of breeding with health and production records of Ayrshire cows: *W. Scot. Coll.*

poultry

inheritance in turkeys of sexual maturity, semen production and persistence in the male and egg production, and hatchability of all eggs set in the female: *Houghton*

hereditary and other factors affecting the laying hen's efficiency of food conversion: *N. Ireland*

heritability and genetic correlations of commercially important traits in the laying hen: *N. Ireland*

genetic variation in mating behaviour and possible correlation with egg production of sisters: *Poultry R.C.*

investigation of correlations between production qualities and morphological characters in poultry: *Poultry R.C.*

possible genetic association between the pattern of egg composition and hatchability: *Poultry R.C.*

sheep

breed susceptibility to scrapie: *Compton*

variation in various characters of a flock of Scottish Blackface sheep: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

correlation between milk and body-size in sheep, based on Italian data: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

genetical aspect of resistance of Scottish Blackface to helminth infestation: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

genetical influence on the worm burden of sheep: *Hill Farm. R.O.* (in collaboration with *Edinburgh Univ.*)

determination of whether resistance to experimental scrapie is inherited: *Moredun* (in collaboration with *Compton*)

Inheritance of Particular Characters

frequency of the gene causing variations in Na/K levels in blood: *A.B.R.O.*

blood groups in cattle: *A.B.R.O.*

effects of selection for and against cannon bone length in Blackface lambs: *A.B.R.O.*

inheritance of fleece characters in Blackface × Wiltshire sheep: *A.B.R.O.*

the inheritance of quantitative characters in *Drosophila*: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

potassium content of erythrocytes of sheep: *Hill Farm. R.O.* (in collaboration with *Rowett*)

survey and classification of the dentition of sheep with reference to possible genetical and nutritional factors: *Hill Farm. R.O.* (in collaboration with *Rowett*, *Edinburgh Univ.* and *N. Scot. Coll.*)

the characterization and inheritance of electrophoretically distinct haemoglobins in the blood of sheep: *London Hosp. Med. School* (R.G.)

Mendelian Genetics

experiments in altering Mendelian ratios (rodents): *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

heterozygosity, viability and developmental rate of larvae in *Drosophila subobscura*: *London Univ., University Coll.* (R.G.)

investigation of gene and chromosome structure associated with taxonomic characters in *Triturus cristatus*: *London Univ., University Coll.* (R.G.)

Mutation

spontaneous and induced mutation rates affecting body size, viability, and egg production in *Drosophila*: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

factors controlling the maintenance of variability in large populations, including the influence of induced mutation in *Drosophila*: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

rate of appearance of new genetic variation in *Drosophila*: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

genetical studies on *Drosophila subobscura*; a sex-limited recessive autosomal mutant intersex: *London Univ., University Coll.* (R.G.)

Physiological Aspects of Genetics

effect of plane of nutrition on response to selection for growth rate; genotype-environment interaction in mice: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

comparison of post-natal growth of mammary glands in different strains in mice: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

physiological basis of genetical differences in growth rate (mice): *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

the study, in *Drosophila*, of the metabolism of nucleic acid components and analogues as they affect development and heredity: *Poultry R.C.*

Progeny Testing

pilot scheme to stimulate the progeny testing of Friesian A.I. bulls for beef: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

analysis of results of different methods of progeny testing dairy bulls: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

use of heterospermic insemination in comparing progeny of two males (rabbit): *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

an analysis of records to see the effectiveness of progeny testing of males and hen families: *Reading Univ., Dept. of Agriculture* (R.G.)

Studies on Identical Twins

a comparison of uniformly treated one-egg twins with pairs of contemporary full sisters (not twins), pairs of contemporary half-sisters and pairs

of unrelated animals as regards lactation characteristics; investigation of genetic correlations and prenatal maternal effects: *A.B.R.O.*

effect of using twin bulls on fertility of mates: *A.B.R.O.*

the performance of pairs of two-egg twins reared and milked in high- and low-producing dairy herds compared with herd mates: *A.B.R.O.*

the incidence and effect of mastitis in twin heifers: *Lasswade* (in collaboration with *A.B.R.O.*)

effect of nutrition on reproduction in identical bull calves: *Unit Repr. Phys.*

Systems of Breeding

general

comparison of progeny bred from 'pedigree' and from 'mountain' rams of the Welsh Mountain breed: *A.B.R.O.*

breeding of poll brown and white Ayrshire cattle: *Compton*

pilot scheme to investigate a system of bull breeding using A.I.: *Edinburgh Univ.*

analysis of contemporary comparisons in evaluating bulls in natural service *Edinburgh Univ., Dept. of Animal Genetics* (B.G.) (in collaboration with *M.B.B.*)

comparison of progeny of Large White and Landrace boars on Wessex Saddleback sows: *Exptl. Husb. Farm, High Mowthorpe*

breeding from lambs and shearlings: *Exptl. Husb. Farms, Boxworth, Bridget's, High Mowthorpe, Trawscoed*

the effects of continuous breeding under intensive conditions of housing: *Harper Adams*

breeding and feeding of pigs in relation to carcass quality: *W. Scot. Coll.*

cross breeding

purebreeding *v.* cyclical crossbreeding of Jersey, Friesian and Ayrshire dairy cattle; heterosis, maternal effects: *A.B.R.O.*

crossbreeding for rate of growth, food conversion and carcass quality in pigs: *Exptl. Husb. Farms, Terrington, Trawscoed*

family selection

the long-term effects of a system of family selection of stock for egg production: *Harper Adams*

the elaboration and testing of a method of family selection in flocks of R.I.R. and Light Sussex birds: *London Univ., Wye College* (R.G.)

heterosis

heterosis in poultry in pure line crosses and repeated back crosses to one parent line: *Poultry R.C.*

the physiological basis of hybrid vigour as disclosed by differences of nutrition requirements of *Drosophila*: *Poultry R.C.*

heterospermic insemination

effect on fertility and on growth of young (rodents): *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

inbreeding

inbred lines of Large White and Wessex Saddleback pigs as alternative to outbreeding: *A.B.R.O.*

closed flock purebreeding based on family merit: *E. Scot. Coll.*

theory of inbreeding and inbreeding effects under different conditions (*Drosophila*): *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

effect of inbreeding and crossing on litter size in mice: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.).

effect of inbreeding on spermatogenesis in *Drosophila*: *London Univ., Dept. of Zoology, University Coll.* (R.G.)

selection

effect of selection for and against hairy birth coats on rate of progress and fleece character: *A.B.R.O.*

effect of natural selection in Blackface sheep: *A.B.R.O.*

selection of Blackface sheep for conformation and nursing ability: *A.B.R.O.*

effects of selection for and against proportion of hair in the lamb fleece of Blackface sheep: *A.B.R.O.*

effects of selection on body size, lactation and litter size in mice: *Edinburgh Univ.*

response to selection for sensitivity to environmental modification (*Drosophila*): *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

consequences of selection for or against extreme variants in mice: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

inheritance of solids-not-fat in milk: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.) (in collaboration with *Hannah*)

a study of selection procedure and mating system designed for the improvement of poultry for meat production: *Harper Adams*

selection of Cheviot sheep for milk yield and lamb growth: *Hill Farm. R.O.* (in collaboration with *A.B.R.O.*)

General

study of population dynamics, vital statistics of breeds, etc.: *A.B.R.O.*

wide crosses amongst rodents: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

analysis of genetic drift in a quantitative character in *Drosophila*: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

the analysis of the concept of fitness and the use of characters closely connected to fitness as models of economic characters (*Drosophila*): *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

quantitative genetics of characters which have a well-defined wild-type (*Drosophila*): *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

ANIMAL PHYSIOLOGY (INCLUDING NUTRITION)

There are the following sub-sections:

Alimentary Physiology and Nutrition, which includes sections on Metabolism and Vitamins; Animal Reproduction; Physiology of Lactation; and General Physiology, which includes sections on Biochemistry, Endocrinology and Environmental Physiology.

ALIMENTARY PHYSIOLOGY AND NUTRITION

Absorption

development of a technique for permanent catheterization of the portal vein in sheep and investigation of the absorption of the products of ruminal digestion by its use: *Babraham*

blood flow through the stomach and gut of sheep and the transport of ions and molecules to the blood from the gut: *Rowett*

absorption of energy-yielding nutrients: *Rowett*

Alimentary Motility and Secretion

factors controlling gastric secretion in the sheep: *Babraham*

histology of the abomasum of the adult sheep in relation to secretory activity: *Babraham*

the structural and functional development of the sheep abomasum: *Babraham*

motor activities of the ruminant stomach: *Liverpool Univ., Dept. of Vet. Preventive Medicine* (R.G.)

initiation of rumination in the calf: *N.I.R.D.*

the physiology of pecking in normal conditions and under heat stress: *Poultry R.C.*

studies of nutrient-endocrine interactions limiting appetite and production in non-ruminants: *Rowett*

the nervous control of the stomach and gut movements in ruminants: *Rowett*

Digestibility and Utilization of food

digestibility of various materials

digestibility of grass, hay, silage and other home-produced foodstuffs: *E. Scot. Coll.*

digestibility studies with winter-cut herbage: *Grassland R.S.*

the nutritive value of home-grown foods as shown by digestion efficiency; estimation of changes in body fat; effect of dietary changes on chemical and physical conditions in the rumen: *N.I.R.D.*

digestibility trials on oat hay: *N. Scot. Coll.*

methods

the accuracy of Faecal Index techniques and their practical application: *Grassland R.S.*

the use of indigestible tracer work, including Cr_2O_3; application in agronomy work: *Grassland R.S.*

development of analytical methods for polysaccharide and lignin analysis, and their use in nutrition studies: *Grassland R.S.*

the development of marker and faeces collection methods for assessing the amount, digestibility and ultimate manurial value of the herbage consumed by cows: *Hannah*

techniques for measuring the herbage intake of grazing animals: *N.I.R.D.*

carbohydrate components of bulky farm foods, their analysis, utilization by the cow and contribution to the volatile acid metabolites: *N.I.R.D.*

measurement of biological value of proteins; 'liver protein' method: *N.I.R.D.*

the technique of experiments on the grazing animal, particularly the estimation of herbage consumption: *Rowett*

the development of chemical and biological methods of assay for amino acids and protein quality: *Rowett*

utilization of various substances

effect of dietary changes on utilization of food by the cow: *N.I.R.D.* (in collaboration with *Bridget's*)

the technique of feeding experiments with, and protein requirements of, young dairy stock: *N.I.R.D.*

studies on the metabolism of short-chain fatty acids by tissues of the ruminant: *Rowett*

studies of the utilization of dietary protein and energy by poultry, pigs and sheep: *Rowett*

pasture composition in relation to animal production using dairy cows both grazing and housed in metabolism stalls: *Rowett*

metabolism of tissue fat and phospholipids in relation to diet: *Rowett*

Digestion (Role of Micro-organisms)

general

effect of antibiotics on the gut flora: *N.I.R.D.*

function of protozoa in the alimentary tract of grazing animals: *Rowett*

activities of micro-organisms on carbohydrates

cellulase activity in the rumen: *Rowett*

β-polyglucosidase activity in the rumen: *Rowett*

β-glucosidase activity in the rumen: *Rowett*

rumen hemicellulose fermentations: *Rowett*

β-xylosidase enzyme systems: *Rowett*

degradation of starches in the rumen and of the polysaccharides of rumen micro-organisms: *Rowett* (in collaboration with *Univ. Coll. N. Wales*)

degradation of soluble grass carbohydrates in the rumen: *Rowett*

activities of micro-organisms on proteins

protein digestion in the rumen of the sheep: *Babraham*

in vitro degradation of proteins by rumen organisms: *Babraham*

nitrogen balance studies in the sheep in relation to ammonia production in the rumen: *Babraham*

the interrelationships of protein and carbohydrate materials during fermentation by rumen micro-organisms: *Babraham*

studies on the utilization of non-protein nitrogen in the rumen: *Hannah*

studies of protein utilization in the lactating goat and ammonia production in the rumen in relation thereto: *Rowett*

activities of micro-organisms: miscellaneous consequences

volatile fatty acid metabolism in the rumen; the proteolytic activity of rumen micro-organisms and the composition of portal blood: *Babraham*

study of the structural adaptations of the alimentary tract of calves to the type of food available: *Compton*

analysis of the contents of various parts of the alimentary tract: *Moredun*

studies of the methane production of sheep on roughage rations: *Rowett*

rumen microbial fat (particularly of protozoa) and the problem of 'essential' fatty acid requirement in ruminants: *Rowett*

the effect of high roughage feeding on rumen developments and subsequent performance: *Rowett*

identification of plant cuticle fragments in rumen and faeces of sheep: *W. Scot. Coll.*

alimentary flora of pigs

intestinal flora of the pig and factors affecting it: *N.I.R.D.*

alimentary flora of poultry

intestinal flora of the chick, in relation to 'infected' and non-infected chicks and to the action of antibiotics on growth: *N.I.R.D.*

the microbiology of the caeca of the chick: *Rowett*

rumen flora

investigation of the metabolism of *Streptococcus bovis*: *Hannah*

investigation of methods of culture of microflora of the rumen of cattle and goats for study of strains: *Hannah*

identification and characterization of lactobacilli, lactic streptococci and propionic acid bacteria, especially in the gut: *N.I.R.D.*

rumen micro-organisms of the cow and factors affecting them: *N.I.R.D.*

enumeration and identification of rumen bacteria active in fermenting natural substrates: *Rowett*

chemical and serological aids in identification of micro-organisms responsible for rumen fermentations: *Rowett*

a study of capsulation in rumen bacteria by serological and other methods; identification of rumen bacteria by serological methods: *Rowett*

cytology of non-protozoan rumen micro-organisms: *Rowett*

isolation of single cells of micro-organisms, particularly small protozoa and large bacteria, of importance in rumen fermentations: *Rowett*

Metabolism and Energy Utilization

general

evaluation of the relative importance of glucose and volatile fatty acids as sources of energy for ruminants and other mammals: *Babraham*

studies of the effects of intermediary products of carbohydrate metabolism on heat losses in ruminants: *Hannah*

the effect of muscular work on the utilization of food by sheep: *Hannah*

the critical temperature of the sheep and allied problems: *Hannah*

in vitro studies of heat losses during the fermentation of cellulose: *Hannah*

direct and indirect methods of determining body composition: *Rowett*

calorimetry

the development of calorimetric methods for the estimation of the energy exchange of sheep and cattle under different conditions of physiological function—growth, fattening, lactation and muscular exercise: *Hannah*

the construction of a large gradient layer calorimeter to take adult pigs and sheep: *Rowett*

calorimetric studies of the metabolism of the young pig: *Rowett*

efficiency

efficiency studies with cows: *Hannah*

energy and protein metabolism

determination of optimal nutritive ratio for egg production when a diet high in available energy is fed; similar digestibility trials using diets low in energy: *Poultry R.C.*

the effect of amino-acid balance and protein quality in the utilization of dietary energy by poultry: *Rowett*

the evaluation of feedingstuffs as sources of energy, amino acids and vitamins, and the influence of processing methods on their nutritive value: *Rowett*

energy value of foodstuffs

the prediction of nutritive value of feedingstuffs for ruminant animals in terms of energy value from their composition and other attributes: *Hannah*

determination of the effect on energy retention of mixing foods of different nutritive value: *Hannah*

determination of the net energy value of feedingstuffs and the effects of environmental and physiological factors on such measurements: *Hannah*

Vitamins

general

the practicability of fortifying hatching eggs with vitamins A, B_2, B_{12}, D_3 by external treatment: *Harper Adams*

vitamin metabolism of the pre-ruminant calf: *N.I.R.D.*

relation of micro-organisms to vitamin synthesis and utilization in the bovine, and to composition of milk: *N.I.R.D.*

vitamin composition and nutritive value of milk from mammals of different species; vitamins in milk low in non-fatty solids: *N.I.R.D.*

development and application of methods for the estimation of vitamins and other nutritional factors; functional form of vitamins: *N.I.R.D.*

the relation of vitamin requirements to feeding levels of proteins, carbohydrates and fats: *Poultry R.C.*

studies of the requirements of pigs and poultry for amino acids and vitamins during growth and reproduction: *Rowett*

vitamin A

new methods of assay of vitamin A: *N.I.R.D.*

conversion of carotene into vitamin A in different animal species; effect of antibiotics: *N.I.R.D.*

the possible relationship between vitamin A deficiency and swayback: *V.I. Centres*

vitamin B

the effect of riboflavin, pyridoxine, pantothenic acid and folic acid on the haematology of the chick, especially on the white-cell series: *Houghton*

biosynthesis of riboflavin: *Liverpool Univ., Dept. of Biochemistry* (R.G.)

function of vitamin B_{12} in relation to biological value of proteins: *N.I.R.D.*

vitamin B_{12} and the 'animal protein factor', breeding of A.P.F.-deficient chicks; 'binding' of vitamin B_{12} with the 'intrinsic factor' and other proteins: *N.I.R.D.*

use of the baby pig for vitamin B_{12} studies: *N.I.R.D.*

vitamin B_{12}-like compounds; distribution in natural products; relation to microbial population of rumen: *N.I.R.D.*

more recently identified members of the vitamin B_2 complex in milk: *N.I.R.D.*

nitrogen metabolism of A.P.F.-deficient chicks receiving vitamin B_{12}: *N. Ireland*

effect of folic acid on nitrogen metabolism in poultry: *N. Ireland*

vitamin B produced in the rumen of sheep; changes found after radical change in ration: *Rowett*

vitamin D

anti-vitamin D in liver, yeast, grass and hay: *N.I.R.D.*

vitamin D assay by radiology: *Rowett*

the vitamin D reserves of sheep: *Rowett*

vitamin E

vitamin E in calf nutrition; activities of different tocopherols and quinones: *Hannah*

vitamin E deficiency; effects on bone development in growing chickens: *Lasswade*

muscular dystrophy; the vitamin E content of different types of silage made at different times of the season; why cannot the disease always be prevented by feeding silage?: *N. Scot. Coll.*

vitamin E deficiency in chicks and crazy chick disease: *Weybridge*

ANIMAL REPRODUCTION (MALE)

Artificial Insemination

intra-vaginal, intra-uterine and intra-peritoneal injection of sperm collected from the *vas deferens* (guinea-pig); *Babraham*

A.I. in mice and rabbits: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

components in avian semen and their effects on storage of semen; the site of fertilization when frozen semen is used; the addition of diluents before or after deep-freeze treatment of semen: *Houghton*

experiments on dilution and storage of turkey semen: *Houghton*

methods for storage of semen at very low temperatures: *Unit Repr. Phys.*

development of techniques for A.I. in the pig: *Unit Repr. Phys.*

Endocrinology in the Male

effect of hormone therapy on the libido of sexually low grade and old cocks: *Poultry R.C.*

relation of male sex hormone to onset of spermatogenesis and function of accessory organs: *Unit Repr. Phys.*

Properties of Semen

semen characteristics of boars during development: *A.B.R.O.*

metabolism of phosphoglycerides in ram seminal fluid; effect on the spermatozoa: *Babraham*

estimation of proportion of fertile sperm in semen; separation of live and dead sperm; radioactive marking of sperm; selective elimination of types of sperm by antibodies: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

correlations between laboratory tests and fertilizing capacity of fowl semen: *Houghton*

experiments on turkey semen: *Houghton*

a laboratory test for the fertilizing quality of semen: *N.I.R.D.* (in collaboration with *Reading Cattle Breeding Centre* and other *A.I. Centres*)

examination of secretions from the male reproductive tract and their significance for storage *in vitro*: *Poultry R.C.*

physiology and biochemistry of semen and of the secretory fluids produced in the seminal vesicles, epididymis, prostate and other accessory organs of reproduction in the male: *Unit Repr. Phys.*

General

investigation of the unusual development of gonadal interstitial tissue in the horse and some seals: *Babraham*

antibiotics and the bacteriology of bovine semen: *N.I.R.D.* (in collaboration with *Reading Cattle Breeding Centre*)

investigation of the causes of differences in the libido of cocks: *Poultry R.C.*

ANIMAL REPRODUCTION (FEMALE)

Endocrinology in the Female

central nervous system and endocrine glands in regulation of female reproductive organs: *Cambridge Univ., Dept. of Zoology* (R.G.)

levels of hormones in the blood of farm animals in various reproductive states: *N.I.R.D.*

oestrogenic substances and the dairy cow: *N.I.R.D.*

the role of oestrogens and progesterone in reproduction, particularly in relation to ovulation and pregnancy: *Unit Repr. Phys.*

Fertility

performance of ewe in relation to its size at birth and weaning: *A.B.R.O.*

a study of fertility in sheep: *Cambridge Univ., School of Agriculture* (R.G.)

effect of thyroxine on fertility of sheep: *Compton*

selective fertilization in mammals: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

side effects on reproduction of feeding pharmaceutical substances (furazolidone, Enheptin and Enheptin A): *Houghton*

the relation between sexual activity of the hen and egg production: *Poultry R.C.*

Reproductive Organs

study of the *corpus luteum* of pregnancy in the guinea pig: *Babraham*

study of *corpus luteum* of pregnancy in the sheep: *Babraham*

histology of the endometrium and ovary during pseudo-pregnancy in the dog: *Babraham*

biochemistry of the uterus: *Cambridge Univ., Dept. of Biochemistry* (R.G.)

a study of the amino-acid composition of the oviduct of the fowl in relation to age, sexual maturity, egg deposition and artificial administration of hormones to immature females: *N. Ireland*

the effect of folic acid deficiency on growth and composition of the oviduct in poultry: *N. Ireland*

studies on the ovary of the fowl with reference to the source and activity of ovarian secretions: *Poultry R.C.*

Techniques

transplantation of eggs in mice: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

technique of egg-transfer in rabbit and goat: *N.I.R.D.*

ovum transplantation and development of media for storage of ova *in vitro*: *Unit Repr. Phys.*

General

induction of ovulation during pregnancy: *Babraham*

super-ovulation in the mouse: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

growth potential of eggs from immature mice: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

parthenogenesis in *Lebistes reticulatus* (a fish): *London Univ., University Coll.* (R.G.)

the movement of material in the uterine tract of cows at different stages of the oestrous cycle and under the influence of hormones: *Unit. Repr. Phys.*

investigation of the transport of sperm and seminal plasma in the reproductive tract of the sow following natural mating: *Unit Repr. Phys.*

ANIMAL REPRODUCTION (FOETUS)

Endocrinology, Growth and Development of the Foetus

mutual effects between embryos during gestation: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

the influence of diffusible tissue-specific substances on organ growth: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

embryonic endocrinology: *Edinburgh Univ., Dept. of Zoology* (R.G.)

Spicer's experiment on stilboestrol and the control of sex: *Poultry R.C.*

Foetal Physiology

sites in the cell of protein synthesis during early development: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

water intake by yolks and its relation to hatchability changes in volume of amniotic fluid in embryonic development: *Poultry R.C.*

biochemistry of the blastocyst: *Unit Repr. Phys.*

Placental Transmission

transmission of antibody globulin from the cow to the foetus: *Babraham*

passage of antitoxins into the rabbit foetus: *Leeds Univ., Dept. of Bacteriology* (R.G.)

investigation of mechanism of passage of maternal plasma proteins to foetus: *Unit Embry.*

General

development of antigenic specificity in organs and tissues: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

experimental embryology of mammals: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

perfusion *in vitro* of the pregnant uterus: *London Univ., University Coll. Dept. of Anatomy* (R.G.)

effect of storage of egg before incubation on growth of embryos: *Poultry R.C.*

PHYSIOLOGY OF LACTATION

Control of the Function of the Mammary Gland

factors controlling the secretory and synthetic activity of the isolated perfused udder: *Babraham* (in collaboration with *Dept. of Agriculture, Oxford Univ.*)

the innervation of the udder of sheep and goats: *Babraham*

galactopoietic effects of anterior-pituitary hormones and of 'target-gland' hormones in goats and cows: *N.I.R.D.*

in vitro assay of prolactin: *N.I.R.D.*

hypothalamic control of pituitary function in relation to the initiation and maintenance of lactation: *N.I.R.D.*

hormonal mechanisms concerned in the maintenance of lactation: *N.I.R.D.*

study of the neuro-endocrine milk-ejection reflex: *N.I.R.D.*

effect of pituitary and target hormones on metabolism of mammary gland slices: *N.I.R.D.*

effects of insulin on lipogenesis *in vitro*: *N.I.R.D.*

Control of Structure of Mammary Glands

analysis of the changing morphology of the mammary tissue during the secretory cycle: *Babraham*

hormonal induction of udder growth and lactation in the goat and cow: *N.I.R.D.*

optimal ratios and levels of oestrogen and progesterone for mammary lobule—alveolar growth in guinea pig: *N.I.R.D.*

mammary growth rates in small animals in relation to hormonal influences; effect of steroids, especially adrenal corticoids on mammary growth and teat growth: *N.I.R.D.*

Milk Components and their Variability

general

studies of variability of fat content of herd bulk milk; occurrence and correction of low fat and solids-not-fat in milk; comparison of hydrometric and gravimetric methods of determining total solids: *E. Scot. Coll.*

effect of mineral supplementation on milk production and composition: *Hannah*

variation in milk composition with stage of lactation and age; effect of spring grazing on milk composition; variations in the non-protein nitrogenous constituents; effect of low roughage-high concentrate rations on milk-fat percentage: *N.I.R.D.*

analytical methods; development of simple and accurate method for total solids and solids-not-fat in milk: *N.I.R.D.*

variations in the chemical composition of the milk of individual cows in a herd: *N. Scot. Coll.*

effects of the plane of nutrition on the butterfat and solids-not-fat in milk: *Rowett*

factors affecting the composition of milk: *W. Scot. Coll.*

fats and fat content

see also general, *above*

milk phosphatides: *N.I.R.D.*

seasonal and district variations in the constitution of milk fat: *N.I.R.D.*

dietary roughage and milk fat: *N.I.R.D.*

nature and metabolism of mammary gland lipids and phospholipids: *Rowett*

proteins

study of the linkage to α- and β-caseins of phosphoric acid: *Hannah*

nature, distribution and properties of the various proteins in milk in relation to stage of lactation; phospholipid-casein relationship: *N.I.R.D.*

fractionation and characterization of β-lacto globulin: *Oxford Univ., Dept. of Biochemistry* (R.G.)

solids-not-fat

see also general, *above*

low non-fatty solids in commercial milk: *N.I.R.D.* (in collaboration with *N.A.A.S.* and *M.M.B.*)

causes and control of low solids-not-fat in milk: *N. Ireland*

long-term study of solids-not-fat content of milk from a dairy herd: *Unit Stat.* (in collaboration with *N. Scot. Coll.*)

Synthetic Mechanisms of the Mammary Gland

enzyme systems of the mammary gland: *Hannah*

synthesis of fat, lactose and protein in the living animal, the perfused udder, mammary gland slices and homogenates: *N.I.R.D.*

species differences between ruminants and non-ruminants in mammary metabolism: *N.I.R.D.*

synthesis of milk constituents by homogenates of mammary tissue: *N.I.R.D.*

investigation of the source of the amino acids of milk proteins using labelled amino acids: *Oxford Univ., Dept. of Agriculture* (R.G.)

General

observations on the venous drainage of the udder: *Babraham*

attempts to record the blood flow through the udder of the conscious ruminant: *Babraham*

technique of milking; assessment of milking efficiency; rate of milk secretion into the udder; milk-flow-recorder milking rates and factors affecting them: *N.I.R.D.*

the variation in the rates of turnover of depot fat with lactation: *N.I.R.D.*

correlation of subsequent milk yield with prior assessment, by palpation, of udder tissue: *W. Scot. Coll.*

GENERAL PHYSIOLOGY

Blood, Cerebrospinal Fluid and Reticulo-Endothelial System

blood

estimations of red-cell volumes in cattle and the disposal of labelled red cells in immune animals: *Babraham*

constituents of bovine blood: *Babraham*

investigation into certain constituents of body fluids: *Babraham*

investigation of the haemoglobin types in cattle and other animals: *Babraham*

the significance of fluctuations in the concentration of blood urea in the sheep: *Babraham*

the fractionation of cattle serum, and the detection in the fractions likely to be used in perfusion techniques of substances advantageous or deleterious to such perfusions: *Babraham*

haematology of normal and abnormal animals: *Compton*

studies on the blood-clotting mechanism in chickens receiving antibiotics, arsenical and sulphonamide drugs: *Houghton*

the effect of certain vitamin analogues on the haematology of the chick: *Houghton*

investigation of the permeability of the red blood corpuscle, especially the mechanism of facilitated diffusion: *London Univ., King's College* (J.R.F.)

quantitative analysis of small molecular constituents of avian blood: *Poultry R.C.*

the synthesis of ergothioneine, and the study of its behaviour in red blood cells and other tissues, especially of birds: *Poultry R.C.*

normal values and ranges for total and protein-bound plasma iodine in cattle of different breeds, ages and sex: *Weybridge*

cerebrospinal fluid

constituents of cerebrospinal fluid and proteins of the plasma in sheep: *Babraham*

reticulo-endothelial system

the physiology of the reticulo-endothelial system, with special reference to the withdrawal of particulate matter, i.e. bacteria, from the circulation: *Babraham*

Cardiovascular, Pulmonary and Renal Physiology

general

physiological 'norms' of conscious sheep (arterial blood pressure, heart rate and respiratory rate): *Babraham*

methods of exteriorization of blood vessels: *Babraham*

adaptation of the indicator dilution method of organ blood flow: *Babraham*

the preparation of fluids suitable for perfusion of isolated mammalian organs: *Babraham*

histological investigation of the nature and distribution of arterio-venous anastomoses in bovine tissues, such as tongue, legs and hooves: *Hannah*

heart

the functional innervation of the heart in the sheep: *Babraham*

the cardiac output and factors controlling the circulation and the respiratory function of the blood in farm animals: *Babraham*

kidney

investigation of renal function in the sheep using clearance techniques, with special reference to urea and ammonia excretion and the role of the kidney in the maintenance of acid-base balance: *Babraham*

examination of certain glucose derivations with a view to their employment as non-metabolized 'markers' of avian urine: *Poultry R.C.*

lungs

the functional innervation of the lungs in the sheep: *Babraham*

the innervation of the pulmonary vascular system in the sheep: *Babraham*

the measurement of pulmonary nerve vasomotor responses in innervated isolated perfused lung preparations: *Babraham*

functional changes in the bronchial vascular system following occlusion of a major pulmonary arterial branch: *Babraham*

the occlusion of pulmonary branches in survival animals: *Babraham*

the measurement of pulmonary vascular pressures in animals with intact thorax: *Babraham*

investigation of the development of pulmonary hypertension and its vasomotor control after systemic pulmonary vascular shunts: *Babraham*

factors concerned in ventilation hindrance of the lungs: *Babraham*

interpretation of respiratory quotients: *N.I.R.D.*

Chemical Physiology and Biochemistry

see also Alimentary Physiology, *page* 63; Chemical Pathology, *page* 89; Endocrinology, *page* 78; Toxic Substances, *page* 96

analytical methods

examination of methods of estimation of small amounts of α-keto acids: *Babraham*

development of a micro-method for the estimation of acetate and fluoroacetate: *Babraham*

determination of body moisture content: *Grassland R.S.*

synthesis and metabolism of isotope-labelled hexoestrol, fatty acids, glucose, glycerol: *N.I.R.D.*

revision of Hilditch procedure of lipid analysis, with emphasis on micro-methods: *Rowett*

enzymes

investigation of the peptidase activity of ribonucleic acid and the sequence of the pyrimidine bases in deoxyribonucleic acid from ox spleen: *Babraham*

improvement in extracting co-enzyme A from brewers' yeast; normal variations in concentration in fresh and exhausted yeast: *Babraham*

investigation of enzymes concerned with lipid metabolism in mammals: *Babraham*

comparative studies of choline esterase and choline acetylase; identification of naturally occurring physiologically active homologues of acetylcholine: *Babraham*

investigation of the action of organo-phosphorus demyelinating compounds: *Babraham*

investigation of rennin and pro-rennin; clotting of milk: *N.I.R.D.*

specificities of β-glucuronidases: *Rowett*

metabolic processes

biochemical investigations on the metabolism of the sheep's heart: *Babraham*

characterization of substances connected with lipid metabolism in ruminants: *Babraham*

metabolic and endocrine studies on piglets: *Babraham*

metabolism of diaminopimelic acid in micro-organisms: *London Univ., Univ. Coll. Hospital Med. School* (R.G.)

biochemical investigation of bacterial motility; the role of arginine in the motility of *Pseudomonas*: *Manchester Univ., Dept. of Bacteriology* (J.R.F.)

metabolism of long-chain fatty acids: *N.I.R.D.*

biosynthesis of chitin: *Oxford Univ., Dept. of Zoology* (R.G.)

the production and embryonic assimilation of phosphoprotein of egg yolk: *Poultry R.C.*

glucuronic acid metabolism in the cell: *Rowett*

mineral metabolism (acid base)

acid-base balance of the milk-fed calf: *N.I.R.D.*

a study of low sodium rations with ruminants: *Rowett*

mineral metabolism (calcium and phosphorus)

mineral metabolism and its relation to skeletal growth and lactation in Blackface sheep: *Hill Farm. R.O.* (in collaboration with *Rowett*)

metabolism of calcium and phosphorus in relation to growth; autoradiographic methods: *N.I.R.D.*

effect of antibiotics on the retention of calcium by chicks on low calcium diets: *N. Ireland*

chemistry of bone changes associated with egglaying in the domestic fowl: *Reading Univ., Dept. of Agric. Chemistry* (R.G.)

comparative studies of X-ray and radio-isotope techniques in bone physiology: *Rowett*

the growth and resorption of bones of sheep under field and laboratory conditions: *Rowett* (in collaboration with *Hill Farm. R.O.*)

histological and radiological studies of the dentition of sheep under field and laboratory conditions: *Rowett* (in collaboration with *Hill Farm. R.O.*)

bone examination of experimental and hill sheep: *Rowett*

mineral metabolism (copper)

a study on the forms in which trace metals, especially copper, occur in biological materials: *Moredun*

investigations on pregnant ewes fed hay and oats with a low copper content: *Moredun*

grazing experiments with sheep on copper-deficient land in Aberdeenshire: *Moredun* (in collaboration with *Macaulay*)

biochemistry of copper in the fowl with special reference to the gizzard as the site of absorption and its possible function in the production of the keratinous inner lining of this organ: *Poultry R.C.*

the state of combination of copper in pasture materials etc.: *Rowett*

the metabolism of naturally occurring copper complexes in the digestive tract of the sheep: *Rowett*

studies of dietary factors influencing the utilization of copper by the rat: *Rowett*

copper therapy by sequestration of copper and copper complexes in sheep: *Rowett*

effect on production of treating cattle with copper deficiency: *V.I. Centres*

copper-molybdenum-inorganic sulphate relationships; effect of molybdenum and inorganic sulphate and other factors in the diet on liver copper storage: *Weybridge*

mineral metabolism (magnesium)

see Chemical Pathology, metabolism of magnesium, *page* 90

mineral metabolism (potassium)
see Chemical Pathology, metabolism of potassium, *page* 90

proteins
behaviour of proteins and peptides in dissociating solvent systems: *Rowett*

non-dietary factors affecting the metabolism of protein: *Rowett*

Endocrinology
metabolism of the thyroid; iodine metabolism and its relationship to phosphorus metabolism: *Babraham*

investigation of the presumed nervous control of the anterior pituitary gland: *Birmingham Univ., Dept. of Anatomy* (R.G.)

effect of oestrogen on the adrenal cortex of the rat: *Bristol Univ., Dept. of Physiology* (R.G.)

effect of growth hormone and insulin on farm animals: *Cambridge Univ., Dept. of Biochemistry* (R.G.)

comparative endocrinology: *Liverpool Univ., Dept. of Zoology* (R.G.)

a study of the steroids in the urine of pregnant mares, pregnant and lactating cows, non-pregnant and gonadectomized goats; abnormalities of steroid metabolism in the cow: *London Univ., Postgraduate Med. School* (R.G.)

replacement studies in rat and goat after removal of the pituitary or adrenals: *N.I.R.D.*

development of new methods for bio-assays of oestrogens, insulin, prolactin and 'quaternaries': *N.I.R.D.*

metabolism of labelled hexoestrol: *N.I.R.D.* (in collaboration with *Middx. Hospital Med. School*)

the response of turkeys to hexoestrol implantation: *N. Scot. Coll.*

studies on the adrenal physiology of the sheep; field and laboratory studies of high and low potassium sheep under varying conditions; comparisons of the potassium and sodium contents of various tissues of both types of sheep: *Rowett* (in collaboration with *Hill Farm. R.O.* and *A.B.R.O.*)

steroid hormone patterns in blood and other tissues of ruminants in health and disease: *Weybridge*

Environmental Physiology
development of instruments and techniques for use in climatic rooms; investigation of thermal stress and sudorifics (adrenergic and cholinergic drugs) on calves; the comparative histology of the skin of tropical and temperate breeds of cattle and other haired animals; investigation of the problem of dry sweating in the horse: *Hannah* (in collaboration with *Porton*)

investigation of the physiological responses to thermal stress; effect of repeated exposure to thermal stress on acclimatization of the young bovine animal: *Hannah*

study of climate and conformation of man and farm animals: *Poultry R.C.*

determination of the 'effective temperature' of the environment for hens penned and in batteries: *Poultry R.C.*

experiments on productivity of hens under a controlled environment: *Poultry R.C.*

ANIMAL PATHOLOGY

This section covers most of the diseases of animals. Research in progress is grouped under two main sub-sections. The first deals with living causal agents of disease and the diseases caused by them and includes, in alphabetical order, viruses, pleural pneumonia-like organisms, bacteria, protozoa, fungi, cestodes, nematodes and arthropod parasites. The second sub-section, General Pathology, deals with aspects of disease not covered above and includes, also in alphabetical order, chemical pathology, toxic substances, pharmacology and therapeutics, immunology, the pathology of various organs and systems, infertility and investigations of the neo-natal period, and includes incidence of diseases.

CAUSAL AGENTS OF DISEASES

Arthropod Parasites

a study of arthropod ectoparasites of poultry: *Houghton*

insects

study of the origin of the midgut, peritrophic membrane and enteric caeca in *Protophormia terrae-novae*: *Glasgow Univ., Dept. of Zoology* (R.G.)

studies on dipterous flies; dung-breeding and/or feeding communities; voltinism of species; laboratory feeding of Diptera and Coleoptera to facilitate larval identification; summering and wintering problems in Diptera; predation and competition in relation to faunal structure: *Moredun*

taxonomy and ecology of genus *Culicoides* and related Ceratopogonidea; surveys of breeding sites in relation to results of suction trapping; laboratory breeding of selected species: *Moredun*

incidence of dipterous pests on stock: *Moredun*

the ecology of the sheep blowfly: *Weybridge*

use of insecticidal dips for the control of blowfly: *Weybridge*

infestation of laboratory animals with warble fly: *Weybridge*

mites and ticks

sheep tick survey: *Hill Farm. R.O.* (in collaboration with *Moredun*)

studies on ticks; pilot dippings with new formulations; comparison of *Ixodes ricinus* with *Haemaphysalis cinnabarina* var. *punctata* and/or other tick species: *Moredun* (in collaboration with *Dept. of Chemistry, Nottingham Univ.*)

pathogenic effects of mite-infected foodstuffs: *Weybridge*

Bacteria and Bacterial Diseases

general

the use of labelled bacteria to determine the routes of infection amongst poultry: *Houghton*

the influence of diet on the susceptibility of chickens to bacterial and protozoal infections: *Houghton*

investigation of bacteria, not of recognized pathogenicity, isolated from lesions in the body of the fowl: *Houghton*

study of mechanisms whereby bacteria gain access to eggs, embryos and chicks: *Houghton*

study of bacteria which cause decomposition of the yolk of chicks: *Houghton*

investigation of the importance of strain variation in organisms isolated from avian post-mortem material: *Houghton*

investigation of serological types of *Bacterium coli* and their relationship to diseases of animals especially calf scours and coliform mastitis in cattle: *London Univ., Royal Veterinary Coll.* (R.G.)

phage-typing of staphylococci: *N.I.R.D.*

infra-red spectra of bacteria in relation to classification: *N.I.R.D.*

studies on the virulence of pathogenic bacteria: *Rowett*

purification of bacterial toxins and antitoxins: *Rowett*

incidence of coliform organisms in milk, crops and insects: *W. Scot. Coll.*

Bacterium coli in poultry and its significance as a cause of mortality in young birds: *Weybridge*

anaerobes: study of strains from various sources; properties of standard *Clostridium welchii* sera: *Weybridge*

anthrax

immunogenic properties of sterile antigens (A.P.P.): *Weybridge*

improvement of diagnostic methods: *Weybridge*

brucellosis

value of the ring test in diagnosis (in collaboration with *Weybridge* and *Public Health Laboratories*); non-specific factors influencing the ring test; antibodies in the blood of vaccinated and infected cattle; immunization of laboratory animals and cattle using adjuvant and fraction antigens: *Compton*

strain 19 *Brucella abortus* vaccine—development of technique for large-scale production in aerated liquid culture: *Lasswade*

studies on the immunization of guinea pigs to *Br. abortus* infection with adjuvant vaccines: *Moredun*

immunological studies in brucellosis: *N. Ireland*

strain 19 *Br. abortus* vaccine—research on freeze-drying: *Weybridge*

the meaning and stability of the species of *Brucella* and of colonial types; methods of estimation of the virulence of *Brucella*; the ring, plate and other serological tests; comparison of the immunity produced in guinea pigs by killed 'rough' and 'smooth' cultures of *Brucella* in adjuvants: *Weybridge*

international reference work on identification, mono-specific sera, standard *Brucella* agglutination serum and antigens for tube and ring tests: *Weybridge*

a study of *Brucella* variants: *Weybridge*

duck septicaemia

investigation of the epidemiology of the disease: *Weybridge*

foot rot of sheep

studies on eradication by treatment with chloromycetin; isolation and transfer to clean pastures: *V.I. Centres*

fowl typhoid

ecology of the causal organism; use of attenuated live vaccines; therapeutic effect of furazolidone on adult carriers: *Lasswade*

controlled trials with two types of attenuated live fowl-typhoid vaccines: *V.I. Centres*

investigation of the efficiency of two live vaccines: *Houghton*

Johne's disease

comparative susceptibility of young and adult cattle to Johne's disease; standard infective dose; immunity; effect of vaccination on usefulness of the tuberculin test: *Compton*

the epidemiology and diagnosis of the disease in cattle and sheep: *E. Scot. Coll.*

correlation of faecal findings with complement fixation test and P.M. examination; immunity induced by an atypical strain of *Mycobacterium johnei*: *Glasgow Univ., Veterinary School* (R.G.)

development of methods to measure the growth of *M. johnei*: *Moredun*

studies on the virulence of *M. johnei*: *Moredun*

development of methods to assess immunity and hyper-sensitivity to *M. johnei* using guinea pigs, rabbits, mice, sheep and tissue culture techniques: *Moredun*

serological tests for Johne's disease: *Moredun*

investigation of cross-immunization between *M. johnei* and *M. tuberculosis* (avian): *Moredun*

diagnosis of the disease: *N. Ireland*

eradication of infection by blood testing and slaughter: *V.I. Centres* (in collaboration with *Weybridge*)

immunity tests with different types of Johne's vaccine on bovines and goats: *Weybridge*

vaccination field trial: *Weybridge*

the value of the complement test in diagnosis and a field trial on its use as a basis for eradication of the disease from infected herds; histological and epidemiological studies of the disease: *Weybridge*

isolation of *M. johnei* from bovine foetuses of clinical and pre-clinical cases: *Weybridge*

cultural work on *M. johnei*; stimulation and inhibition of growth by other organisms in the media; cultural methods of diagnosis: *Weybridge*

mastitis

relationship of milking technique to the incidence of mastitis: *Compton*

determination of the relative therapeutic value of antibiotics in the treatment of bovine mastitis and other bacterial diseases; investigation of pathogenesis, pathology and immunology of mastitis; typing of streptococci and staphylococci; typing of staphylococcal mastitis with bacteriophage: *Compton* (in collaboration with *Central Public Health Laboratories*)

control of sub-clinical mastitis by antibiotic treatment: *Hannah*

the bacteriology and pathology of sub-clinical mastitis: *Hannah*

management and udder infection; influence of vacuum level; methods of 'drying-off' in relation to udder infections; dry period infections: *N.I.R.D.*

eradication of *Streptococcus agalactiae* infection by repeated testing of milk and the treatment of infected animals: *V.I. Centres*

bacteriological studies on mastitis-causing organisms: *W. Scot. Coll.*

study of the organisms in mastitis of dry cows; source of *Corynebacterium pyogenes* infections; experimental transmission by flies; vaccination experiment in dry cows: *Weybridge*

field trial of *Str. agalactiae* vaccine; field trial of a new disinfectant for controlling the spread of *Str. agalactiae* in herds where chronic infection exists: *Weybridge*

preliminary experiments on intramammary vaccination with killed staphylococcal vaccines; epidemiology of staphylococcal mastitis; phage typing; isolation of staphylococci from various parts of the cow and its environment; investigation of use of adequately disinfected milking units in controlling spread of infection: *Weybridge*

pasteurellosis

the classification of *Pasteurella*: *E. Scot. Coll.*

experimental reproduction of pasteurella haemolytic infection in sheep; investigation into the effect of normal body secretions upon the organism; *in vitro* reactions of normal and immune serum to the organism: *Moredun*

serological typing of strains of *P. haemolytica*: *Moredun*

the enhancement of virulence of *P. haemolytica* for laboratory animals by various methods: *Moredun*

pullorum disease

analyses from toxic fractions of cultures of *Salmonella pullorum* by the diffusion method: *Houghton*

investigation of unusual outbreaks of non-specific reactions to the blood test: *Weybridge*

the value of furazolidone in the treatment of adult carriers of *Salmonella* infection, particularly pullorum disease: *Weybridge*

respiratory diseases of poultry

bacterial respiratory diseases in chickens; the relative importance of routes of infection; the effectiveness of methods of controlling infection: *Houghton*

***Salmonella* infections in poultry**

typing of organisms and preparation of antigens for use in field outbreaks: *Weybridge*

the value of furazolidone in the treatment of adult carriers of *Salmonella* infection: *Weybridge*

other references: fowl typhoid, *above*; pullorum disease, *above*

swine erysipelas

pathogenic properties of different strains of *Erysipelothrix rhusiopathiae*; immunity tests on pigs simultaneously inoculated with crystal violet vaccine and swine erysipelas vaccine: *Weybridge*

tick pyaemia

the comparative susceptibility of tick-borne fever-infected and normal lambs to the intravenous inoculation of staphylococci: *Moredun*

immunization experiments against staphylococci and their products; preparation of vaccines; immunization of laboratory animals and sheep and examination of their sera: *Moredun*

tuberculosis

infections with acid-fast bacteria; investigation of strains of tubercle bacilli of obscure or possibly human origin; culture of the flora in skin tuberculosis; investigation of the sensitizing of guinea pigs to tuberculins by saprophytic acid-fast bacteria: *Lasswade*

immunity to tuberculosis: *Rowett*

identification and classification of acid-fast bacilli in normal animals; the effect on tuberculin sensitivity in calves of the superimposing of acid-fast infections; acid-fast infections of bovines other than tuberculosis and Johne's disease: *Weybridge*

attempts to identify the antibodies present in serum at various stages of infection, particularly in animals which have become negative to the skin test: *Weybridge*

preparation of a tuberculin with maximum reactivity in the tuberculous animal and minimum reactivity in the uninfected, non-specifically sensitized animal: *Weybridge*

serological reactions in tuberculosis and other acid-fast infections: *Weybridge*

the effect of storage over long periods on the virulence of *M. tuberculosis*, bovine type: *Weybridge*

vibriosis

typing of *Vibrio foetus*; pathogenicity of these strains for laboratory animals; immunological studies: *Compton*

chemotherapy in female and male and control by treatment of semen: *Weybridge*

Cestodes and Cestode Infestations

survey of liver-fluke snails and fluke egg counts in faecal samples: *Hill Farm. R.O.* (in collaboration with *Weybridge* and *W. Scot. Coll.*)

cestode parasites of poultry; the study of control methods as applied by the control of intermediate hosts and chemotherapy; study of the natural history of known intermediate hosts and a search for alternative ones: *Houghton*

a study of the ecology of *Limnaea truncatula* to find a method of collecting the snail from areas where the water has dried up: *N. Scot. Coll.*

a study of the ecology of the fluke snail, its control and an endeavour to forecast approaching epidemics: *Weybridge*

Fungi and Fungal Diseases

evolution of special mycological techniques for *Candida* and *Aspergillus*: *Houghton*

a study of the modification of keratin caused by dermatophyte fungi and of the fluorescent materials they produce: *Leeds Univ., Dept. of Biochemistry* (R.G.)

ringworm: study of the disease with particular reference to the role of vitamin A: *V.I. Centres*

investigation of the part played by fungi in the production of animal disease: *Weybridge*

Nematodes and Nematode Infestation

general

internal parasites in sheep: *Durham Univ., School of Agriculture* (R.G.)

immunological aspects of helminth infestation in sheep: *Moredun*

observations on ecology of free-living phases of nematodes: *Moredun*

establishment of pure infestations of at least three species representing *Ostertagia, Trichostrongylus* and *Nematodirus* in sheep, and of *Graphidium* sp. and *Trichostrongylus* in rabbits: *Moredun*

observations on numbers and significance of *Nematodirus battus* and *N. fillicollis*; distribution, spatial and seasonal, of eggs and infective larvae in soil and herbage: *Moredun*

studies on the mechanism of resistance of rats to nematode infestations: *Rowett*

pathogenesis of *Trichostrongylus axei* and of *Nematodirus* spp. and their control: *Weybridge*

immunological relationships between *Trichostrongylus retortaeformis* and the rabbit: *Weybridge*

Ascaridia

studies on *Ascaridia*: *Houghton*

Heterakis

factors favouring the embryonation of *Heterakis* ova: *Houghton*

parasitic bronchitis

a study of the effects of age at which the animal is first exposed to husk: *Exptl. Husb. Farm, Boxworth*

a study of the fundamental serological and cellular changes associated with immunity to helminth diseases, especially lungworm infestation; the possibility of an immunological approach to prophylaxis: *Glasgow Univ., Veterinary School* (R.G.) (in collaboration with *Compton*)

effect of level of worm infestation on the survival and availability to the grazing animal of lungworm larvae: *Grassland R.S.*

lungworm infestation: assessment of the value of new compounds in the treatment of naturally and experimentally infected calves: *V.I. Centres*

bionomics of lungworm larva on the pastures: *Weybridge*

parasitic bronchitis in bovines; epidemiology (including immunological relationships) and control; association with grazing behaviour: *Weybridge*

parasitic gastro-enteritis in cattle

intestinal parasites of hill cattle: *W. Scot. Coll.*

parasitic gastro-enteritis in sheep

repeatability of estimates of helminth infestation based on faecal egg count; relation of egg count to body weight: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

investigation of the build-up of *Nematodirus* infestation on a 3-year ley: *Exptl. Husb. Farm, Trawscoed*

worm infestation and density of stocking by ewes and lambs in relation to production per acre: *Grassland R.S.*

the control of worm infestation in sheep by grazing management: *Grassland R.S.*

the influence of mixed grazing on the parasite burdens of sheep and cattle: *Grassland R.S.*

effect of level of worm infestation on the productivity of lambs at pasture: *Grassland R.S.*

helminth survey; worm egg counts of sheep: *Hill Farm R.O.* (in collaboration with *Moredun*)

survey of helminth infestation in selected flocks; identification of infestation patterns in different environments: *Moredun*

control of worm infestation in sheep maintained under system of intensive rotational grazing: *N.A.A.S.*

nutrition and helminth infestations in sheep: *Rowett*

Nematodirus infestation: treatment and prevention trials: *V.I. Centre*

Pleuropneumonia-like Organisms

isolation and typing of P.P.L.O. from chickens with and without chronic respiratory disease: *Cambridge Univ., Dept. of Animal Pathology* (R.G.)

Protozoa and Protozoal Infestations

Babesia

exploratory studies on *Babesia* infections: *Weybridge*

coccidiosis

determination of the characters of highly pathogenic intestinal coccidia; effects of different intensities of parasitism; chemotherapeutic studies of infections derived from single-cell inocula; a study of immunity to coccidia; effects of diet on coccidiosis: *Houghton*

review of species of coccidia occurring in turkeys: *Houghton*

ecology of built-up litter: *Houghton*

investigation of coccidiosis in turkeys: *Liverpool Univ., Dept. of Vet. Preventive Medicine* (R.G.)

epidemiology of coccidiosis in deep-litter houses with particular reference to intestinal forms: *Weybridge*

histomoniasis

study of chemotherapy of and immunity to histomoniasis; studies on the *Histomonas/Heterakis* relationship; a search for a practicable disinfectant against *Heterakis* ova; nutritional approach to control: *Houghton*

protozoan physiology

comparative physiology of parasitic protozoa and helminths: *Cambridge Univ., Molteno Institute* (R.G.)

trichomoniasis

trichomoniasis in cattle in relation to A.I. practice: *Weybridge*

Viruses and Virus Diseases

general

application of the electron microscope to the elucidation of the structure of viruses, mitochondria, spermatozoa etc.: *Cambridge Univ., Cavendish Laboratory* with *Dept. of Animal Pathology* and *Dept. of Zoology* (R.G.)

viruses carried by British mosquitoes: *London Univ., University Coll., Dept. of Zoology* (R.G.)

clinical study and identification of a new calf virus: *Weybridge*

atrophic rhinitis

see rhinitis, *below*

Aujesky's disease

studies on Aujesky's disease: *Weybridge*

chronic respiratory disease of poultry

search for known and unknown infectious agents in outbreaks of chronic respiratory disease; relationship between c.r.d. of chicks and infectious sinusitis of turkeys: *Cambridge Univ., Dept. of Animal Pathology* (R.G.)

detailed study of a single strain of the organism: *Weybridge*

duck virus hepatitis

methods of immunization and transfer of immunity to embryo; duration of immunity; prophylactic value of serum from immunized or recovered birds: *Weybridge*

enzootic abortion of sheep

the duration of vaccinal immunity to enzootic abortion: *Moredun*

foot and mouth disease

detailed study of the conditions necessary for the growth of the virus in tissue culture; investigations on virus structure and methods of concentrating and purifying virus preparations; investigations of changes occurring in tissues affected with foot and mouth virus; elaboration of methods of quantitative determination of virus; investigation of effects of virus on widely varied and unusual host animals; collection and analysis of information on world-wide epidemiology of foot and mouth; production of vaccines and study of vaccinal immunity: *Pirbright*

infectious avian encephalomyelitis (epidemic tremor)

the possibility of egg transmission of the disease: *Weybridge*

avian leucosis

an investigation into the ribonucleic acid and desoxyribonucleic acid content of normal and neoplastic tissues in the chick: *Houghton*

an investigation of respiration and glycolysis of normal and neoplastic tissues in relation to leucosis in the fowl: *Houghton*

comparative histopathology of lymphoid leucosis: *Lasswade* (in collaboration with *Poultry R.C.*)

investigations into the biology and biochemistry of viruses causing cancer and leukaemia in fowls; the genetics of resistance and susceptibility to these viruses; studies of the 'eclipse phase' in the multiplication of fowl leukaemia virus subsequent to infection: *Poultry R.C.*

louping-ill

the cultivation of high-titre virus *in vitro*: *Moredun*

myxomatosis

the role of the rabbit flea and the sheep tick in myxomatosis: *N. Scot. Coll.*

epidemiology of myxomatosis in Great Britain; study of virus strains isolated from different areas: *Weybridge*

orf

study of natural outbreak in ewes: *Compton*

rhinitis

a study of transmission, aetiology and pathology: *E. Scot. Coll.*

investigation of atrophic rhinitis, including body rhinitis and other diseases of the pig snout: *Weybridge*

swine fever

immunity tests on pigs given crystal violet vaccine at two weeks: *Weybridge*

histology of brain changes in relation to diagnosis; serological diagnosis: *Weybridge*

tissue culture studies: *Weybridge*

field trial on the use of lapinized swine fever virus to control outbreaks of the disease: *Weybridge*

experiments on the properties and use of lapinized virus: *Weybridge*

tick-borne fever

studies on the life-cycle of the virus in the sheep and the tick: *Moredun*

examination of the part played by maternally transmitted immunity to tick-borne fever: *Moredun*

vesicular exanthema

preparation of diagnostic antisera against the different types of vesicular exanthema of swine: *Pirbright*

vesicular stomatitis

investigation of this and similar conditions along with foot-and-mouth disease: *Pirbright*

virus pneumonia of pigs

see also Pathology of Various Organs and Systems, *page* 94

study of pathogenesis of virus pneumonia of pigs and other pneumonic conditions: *Compton*

GENERAL PATHOLOGY

Chemical Pathology

see also Chemical Physiology and Biochemistry, *page* 75; Toxic Substances, *below*

general

mineral balance and metabolic changes and disorders in calf and cow: *N.I.R.D.*

acetonaemia

bovine acetonaemia: *Bristol Univ., Dept. of Physiology* (R.G.)

biochemistry of pregnant and lactating cows, especially in relation to ketosis: *Liverpool Univ., Dept. of Biochemistry* (R.G.)

routine milk sampling to pick out early cases of acetonaemia to see if treatment of these will prevent symptoms developing: *N. Scot. Coll.*

chemical tests for acetone in biological fluids: *N. Scot. Coll.*

liver function

investigation of the mechanism of fatty liver formation and the role of lipotropic substances: *Babraham*

investigations into some clinical aspects of liver function in ruminants: *Babraham*

metabolism of magnesium

incidence of hypomagnesaemic trouble and control by addition of magnesium compounds to grass and silage: *E. Scot. Coll.*

studies of magnesium metabolism in calves and other cattle, using radioactive magnesium: *Hannah*

feeding of herbage known to induce hypomagnesaemia; fractionation of the herbage and identification of the factor responsible; examination of the suitability of small laboratory animals for testing: *Moredun*

the effect on the absorption and excretion by sheep of magnesium and calcium and on water balance of ammonium salts, potassium salts, ion exchange resins, porphyrins and other chelating agents: *Moredun*

relation of grassland management to hypomagnesaemia, to grass tetany and other metabolic disorders: *N.I.R.D.*

magnesium metabolism of the milk-fed calf: *N.I.R.D.*

measures aimed at preventing hypomagnesaemia in cattle and sheep: *N. Scot. Coll.*

investigation of the effects of various manurial treatments of pasture on the incidence of hypomagnesaemia in adult cattle; the value of magnesium-containing manures as a means of prevention; comparison of calcined magnesite and dolomite; analyses of 'tetany-prone' and normal pastures; studies of the 'digestibility' of magnesium in different pastures: *Weybridge*

factors concerned in the depletion of magnesium, and production of tetany in calves fed on rations consisting mainly of milk; prophylactic feeding of magnesium supplements; milk magnesium levels in cows receiving magnesium by mouth: *Weybridge*

metabolism of potassium

experiments on the effect of the potassium content of the diet on muscular degeneration in calves: *Hannah*

shock and injury

biological investigation into a blood de-aminase known to increase in animals suffering from operative 'shock': *Babraham*

dietary factors affecting the metabolism of protein following injury: *Rowett*

metabolism of labelled protein by normal, fractured and cortisone-treated rats: *Rowett* (in collaboration with *Nat. Inst. for Medical Research*)

Diseases of Uncertain Aetiology not mentioned elsewhere

see also Chemical Pathology, *above*; Toxic Substances, *below*

ataxia of sheep

a disease of sheep with ataxic and nervous symptoms due to a myelin deficiency and distinct from sway-back: *Weybridge*

bowel oedema in pigs

collection of data on serum-protein levels in normal and diseased pigs; fractionation of oedema-producing 'oedema fluid' from field cases; investigation of the significance of the haemolytic coliform organism present in typical outbreaks: *Weybridge*

***leptomeningitis eosinophilica* of pigs**

occurence and relation to salt poisoning: *Weybridge*

pullet disease

pathology of the avian kidney and its relationship to clinical conditions: *Houghton*

the production of allergic nephritis experimentally: *Poultry R.C.*

research into aetiology: *Weybridge*

roundheart disease

an investigation of roundheart disease in poultry: *Houghton*

attempts at transmission: *Lasswade*

scrapie

neurological studies: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.)

electron microscope studies of causal agent: *Compton*

pathogenesis of the disease: histological studies: *Compton*

transmission experiments with goats: *Compton*

investigation of breed susceptibility and genetical and congenital aspects of the disease: *Compton*

characterization of the causal agent: its inactivation, culture, transmission by various routes, adaptation to different hosts, isolation from different breeds of sheep; electron microscope studies: *Moredun*

pathogenesis of the disease: histology of C.N.S.: *Moredun*

immunological aspects of the disease: *Moredun*

stiff lamb disease

investigation of Leadhills stiff lamb disease: *Moredun*

Immunology

general

the investigation of the absorption of homologous and heterologous proteins fed to the new-born calf, with special reference to the development of hypersensitivity: *Babraham*

an immunological approach to the prophylaxis of parasitic bronchitis in calves: *Glasgow Univ., Veterinary School* (R.G.)

to see whether membranes through which passive immunity is transmitted in different species are selective: *Unit Embry.*

labelling of proteins with C^{14} for *in vivo* studies: *Unit Embry.*

immunology and chemotherapy of caecal coccidiosis and histomoniasis in poultry with particular reference to potentation: *Weybridge*

antibodies

immunological studies on antibodies: *Babraham*

the immunological and physico-chemical study of the local antibodies in the reproductive tract of cattle; comparison with the humoral antibodies: *Babraham*

the production and excretion of urinary and copro-antibody in adult cattle: *Babraham*

the labelling of antibody, and therefore virus, with fluorescent organic substances: *Pirbright*

purification of bacterial toxins and antitoxins: *Rowett*

the effect of antibodies on *Cl. welchii* infections in embryonated eggs: *Rowett* (with *Wellcome Research Laboratories*)

blood groups

the preservation of the red cell blood group antigens of cattle and pigs at low temperatures: *Babraham*

blood groups in the pig: *Cambridge Univ., Dept. of Pathology* (R.G.)

haemolytic disease in pigs: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.)

the production of haemolytic disease in young mice by the administration of various anti-rat red cell sera by mouth: *Unit Embry.*

cellular aspects of immunity

tolerance of tissue grafts: *London Univ., Dept. of Zoology, University Coll.* (R.G.)

cellular aspects of immunity: *Rowett*

serology

studies in immunology and serology: *Cambridge Univ., Dept. of Pathology* (R.G.)

serological studies; serological typing of streptococci and staphylococci; serological methods for detecting lung diseases in pigs; immunology of mastitis; hyaluronidase as a factor in infection: *Compton*

the separation by zone electrophoresis of the components of cattle serum: *Pirbright*

examination of the antibodies of foot-and-mouth disease by paper electrophoresis: *Pirbright*

investigation into improved methods of producing high-titre sera, including the possible use of adjuvants: *Pirbright*

serology of streptococci: *Reading Univ., Dept. of Microbiology* (R.G.)

Incidence of Disease

cattle

survey of reservoirs of ringworm infection: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.) (in collaboration with Cambridge, Addenbrooke's Hospital)

survey of incidence and importance of Johne's disease: *Glasgow Univ., Veterinary School* (R.G.)

survey of mortality and morbidity in cattle: *N. Ireland*

survey and study of infertility in cattle: *Priv. Centres A.I. Group*

a sample survey for the study of calf mortality in N.E. Scotland: *Unit Stat.* (in collaboration with *N. Scot. Coll.*)

calf mortality: survey and control in dairy herds: *W. Scot. Coll.*

collection of accurate data on diseases of dairy cattle: *Weybridge*

pigs

survey of mortality and morbidity in pigs: *N. Ireland*

surveys of rates and causes of mortality in pigs: *V.I. Centres*

survey of diseases of piglets: *Weybridge*

poultry

survey on incidence of avian diseases based on the examinations of material from two laying trials: *Houghton*

sheep

survey of mortality and morbidity in sheep: *N. Ireland*

lamb losses on hill land: *W. Scot. Coll.*

wild animals

studies of naturally occurring diseases in wild birds and mammals: *Compton*

Infertility

see also specific conditions leading to infertility

a study of reproduction of the pig, with special reference to the incidence and distribution of pre-natal mortality: *Babraham*

the histology of the bovine reproductive tract with reference to the site of local antibody formation: *Babraham*

pre-natal mortality in the white rat: *Babraham*

sterility in A.I. bulls; the importance of feminism and testicular atrophy: *E. Scot. Coll.*

the effect of immunological incompatibility between mother and young: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

causes of increase in early embryonic mortality when maintaining fertility during the period of normal decline in poultry: *Houghton*

survey and study of infertility in cattle: *Priv. Centres A.I. Group*

the depressant effect of rations containing large amounts of fish meal on hatchability in breeding hens: *Reading Univ., Dept. of Agriculture* (R.G.)

immunological reactions in semen and their relation to fertility: *Unit Repr. Phys.*

determination of the roles of the genetics of the egg and the maternal environment in producing embryonic mortality in the rabbit: *Unit Repr. Phys.*

abortion and infertility; studies on various aspects of abortion and infertility; abortion due to infective agents other than those recognized at present; causes of infertility which lead to culling from the herd; surveys into the causes of herd infertility: *V.I. Centres*

trichomoniasis in cattle in relation to A.I. practice: *Weybridge*

study of a condition similar in clinical nature to vibriosis but apparently caused by a virus: *Weybridge*

Investigation in the Neonatal Period

the investigation of the physico-chemical nature of the urinary proteins of the new-born calf: *Babraham*

neonatal mortality in animals: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.)

haemolytic disease in pigs: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.)

studies of antibodies in colostrum and serum of sheep: *Rowett*

the transmission of certain proteins of high biological activity through the gut of the new-born rat: *Unit Embry.*

non-specific mortality of baby chicks—a study of the effects of deliberate chilling: *Weybridge*

Pathology of Various Organs and Systems

investigation of histochemical changes associated with degenerative lesions of nerve tissues: *Babraham*

pneumonia in calves: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.)

piglet anaemia: *Glasgow Univ., Veterinary School* (R.G.)

pathology of pneumonia in pigs: *Glasgow Univ., Veterinary School* (R.G.)

histo-pathology of udders from cows cast from the institute herd (udders which pose some problem such as resistance to treatment, or persistent high cell counts without mastitis organisms in the milk): *Hannah*

the effect of sub-clinical mastitis on the yield of individual quarters through more than one lactation: *Hannah*

an investigation of the haemorrhagic syndrome in poultry: *Houghton*

an investigation of non-specific haemorrhagic enteritis in turkey poults: *Houghton*

the pathology of placentitis; permeability of the infected placenta; defence mechanisms of the conceptus against infection; placentitis induced by *Br. abortus* and other agents: *London Univ., University Coll. Hosp. Med. School* (in collaboration with *Compton*) (V.R.F.)

cytological studies of the ovaries and testes of sheep affected with scrapie: *Moredun*

anaemia in pigs—comparison of methods of prevention: *N.I.R.D.*

effect of nutritional anaemia on pre-weaning growth in pigs: *N. Ireland*

inheritance of tumours in poultry: *N. Ireland*

mastitis in ewes: *W. Scot. Coll.*

avian haematology and its relationship to disease: *Weybridge*

arterio-sclerosis in fowls and turkeys: *Weybridge*

study of brain pathology and nervous diseases of pigs: *Weybridge*

Pharmacology and Therapeutics

effect of hexamethonium compounds on anaesthetized animals: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.)

anthelmintics: *Edinburgh Univ., Heriot Watt Coll.* (R.G.) (in collaboration with *Royal (Dick) School of Vet. Studies*)

the use of aerosols for surface sterilization; possible use of furfuraldehyde in a kerosene base and with formalin: *Houghton*

the effect of tumour inhibitory compounds: (*a*) vitamin analogues, (*b*) antipurines and antipyrimidines: *Houghton*

comparison of the anticoagulant effect of heparin and dextran sulphate in guinea pigs: *Lasswade*

effect of newer antibiotics on the course of scrapie: *Moredun*

study of Nisin and Nisin-like substances obtained from lactic acid bacteria: *N.I.R.D.*

the value of stilboestrol implantation of synthetic oestrogens on fattening of lambs and steers: *Rowett*

treatment of mastitis: *W. Scot. Coll.*

sheep dips; differential adsorption and persistence of BHC, DDT, dieldrin and aldrin on sheep fleece: *Weybridge*

field trials on new mastitis therapeutic agents: *Weybridge*

field trials on the effect of milking techniques on the incidence of mastitis: *Weybridge*

Toxic Substances

general

factors in herbage which may cause scouring: *Grassland R.S.*

metabolic fate of chlorinated compounds: *London Univ., Dept. of Biochemistry, St Mary's Hosp. Med. School* (R.G.)

bloat

preliminary observations on bloat: *Compton*

survey of bloat in cattle: *W. Scot. Coll.*

bracken poisoning

bracken poisoning: *Rowett*

bracken poisoning: *Univ. Coll. N. Wales, Dept. of Agric. Chemistry* (B.G.)

effects on animals of products of bracken thiaminase acting on vitamin B_1, and different cofactors: *Univ. Coll. N. Wales, Dept. of Agric. Chemistry* (R.G.)

clinical and pathological features in experimental bracken poisoning: *V.I. Centres*

fluoracetate

biochemistry of the poisonous principle in *Dichapetalum* spp.: *Babraham* (in collaboration with *Veterinary Services in Uganda*)

biochemistry of fluoracetate poisoning in sheep; metabolic effects of fluorocompounds; properties of fluorocitric and fluoropyruvic acids; preparation of radioactive fluorocitric acid: *Babraham*

fluorine

effects of fluorine on bone metabolism: *Leeds Univ., Dental School* (R.G.)

fluorosis in cattle: *W. Scot. Coll.*

assessment of the frequency of fluorosis and degree of production losses in the industrial areas involved: *Weybridge*

insecticides, rodenticides etc.

investigation of the toxicity of newer rodenticides and organic phosphorus insecticides: *Weybridge*

the possible toxicity to wild birds, game and domestic poultry of insecticides, etc. used as dressings for seed corn: *Weybridge*

oestrogenic substances in plants

identification of a new potent oestrogen from plant material: *N.I.R.D.* (in collaboration with *Courtauld Institute of Biochemistry, Middlesex Hospital*)

the significance of oestrogenic factors in pastures and silage: *Weybridge*

senecio alkaloids

the effects of senecio alkaloids on the fowl: *Poultry R.C.*

ANIMAL PRODUCTS

This section includes work on Milk and Dairying, Cheese and Cheesemaking, Eggs, Meat and Wool. A large amount of work bearing on these subjects is listed under other headings and reference to these is made in the appropriate place.

Cheese and Cheesemaking

studies on cheese made from the milk of cows treated with penicillin: *Exptl. Husb. Farms*

flora of milk in relation to cheese quality; flora of ordinary cheese; properties of the organisms causing 'blowing' in cheese: *N.I.R.D.*

single-strain starters and cheesemaking without starters: *N.I.R.D.*

effect on cheesemaking of various chemical sterilizing agents, penicillinase and other adventitious substances: *N.I.R.D.*

substances responsible for flavour in cheese; changes during ripening; protein degradation products in cheese: *N.I.R.D.*

processed cheese; quality in relation to the physical properties of the original ingredients: *N.I.R.D.*

causes of variation in the mechanical properties (of commercial importance) in cheese and processed cheese; use of pitching apparatus and ball compressor; hot-iron test of cheese: *N.I.R.D.*

measurement of physical properties of cheese: *N.I.R.D.*

use of fungicides and acaricides in cheese bandages, etc.: *N.I.R.D.*

Eggs

to ascertain whether quality as measured by candling is linked to individual birds and/or system of housing: *Exptl. Husb. Farms*

microbiology of eggs and egg products; investigation of cleaning of eggs in relation to keeping quality under different storage conditions; methods of heat treatment for whole shell and liquid egg to improve keeping quality: *N. Ireland*

study of the hen egg shell: *Reading Univ., Dept. of Agricultural Chemistry* (R.G.)

Meat

relationship of breeds and crosses to carcass quality of beef: *Cambridge Univ., School of Agriculture* (R.G.)

survey of cattle passing through auction markets and deadweight centres with reference to breed, age, sex, liveweight, killing-out percentage and price: *Cambridge Univ., School of Agriculture* (R.G.)

quantitative investigation into demand for beef in different areas with a possible investigation into grading standards: *Cambridge Univ., School of Agriculture* (R.G.)

investigations into carcass quality assessment with particular reference to the technique of visual assessment and the inter-relationships of carcass measurements, visual assessments and carcass composition: *Cambridge Univ., School of Agriculture* (R.G.)

output of beef and mutton under normal grazing management: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

genetic differences between bull breeding herds; genetics of beef and milk production in dual-purpose cattle; compatibility of milk and beef; analysis of data from Danish testing stations: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

pilot scheme to stimulate the progeny testing of Friesian A.I. bulls for beef: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

crossbreeding for rate of growth, food conversion and carcass quality in pigs: *Exptl. Husb. Farms, Terrington, Trawscoed*

management of the sward for fat lamb production: *Grassland R.S.*

value of winter grazing for beef stores: *Grassland R.S.*

studies on the processing and packaging of poultry: *Harper Adams*

fattening ability of hill lambs, including carcass investigations: *Hill Farm. R.O.*

high- and low-energy diets in relation to growth and carcass quality in pigs: *N. Ireland*

a method for the determination of nitrates in bacon-curing brines: *N. Ireland*

interactions of heredity and environment in the fattening and carcass quality of bacon pigs: *N. Ireland*

relationship between growth rates at various ages and the carcass quality of bacon pigs: *N. Ireland*

the effect of feeding and implantation of synthetic hormones to sheep and cattle on changes in body composition: *Rowett*

the effect of early nutrition of the calf on body composition: *Rowett*

the feeding value of silage and other fodders on beef production: *Rowett*

problems associated with production of high-quality bacon carcasses: *Rowett*

breeding and feeding of pigs in relation to carcass quality: *W. Scot. Coll.*

Milk and Dairying

bacteriology

the sources of *Streptococcus thermophilus* and its incidence in milk supplies: *E. Scot. Coll.*

conditions controlling the formation and the germination of the spores of *Bacillus cereus* on dairy equipment and in milk: *E. Scot. Coll.*

bacteriology of refrigerated bulk storage of milk: *E. Scot. Coll.*

investigation of the effect of other bacteria present in milk on the growth and detection of coliform bacteria in the milk: *Hannah*

investigation of the causes of the low survival rate of bacterial spores dried in milk when held at extremely low humidities: *Hannah*

study of the factors in nutrient agar inhibitory to the growth of certain bacteria isolated from sterilized milk: *Hannah*

investigation of temperature relationships and types of coli-aerogenes organisms in relation to the presumptive coli-aerogenes test for milk: *N. Ireland*

equipment

efficiency of milk cooling by a bulk tank: *E. Scot. Coll.*

design and testing of a heat pump unit for the combined duty of milk cooling and water heating: *E.R.A.*

milking sheds: comparison of various bedding materials; cost and effectiveness of straw as compared with lime and sawdust: *Exptl. Husb. Farms*

milking machines: effect of pulsation rates; principles of milk machine design; design of liner and incidence of udder disease: *N.I.R.D.*

milk cooling on farm: experimental work with new design of chilled-water plant, using mains water: *N.I.R.D.*

trials of prototype farm heat pump: *N.I.R.D.* (in collaboration with *E.R.A.*)

standards for milk filtration: *N.I.R.D.*

bulk milk collection: *N.I.R.D.*

processing of milk

investigation of the factors determining the predominance of particular groups of bacteria at different stages in the storage-life of pasteurized milk: *Hannah*

pasteurized milk: correlation of changes in composition occurring during the storage of pasteurized milk with bacterial growth: *Hannah*

investigations of the factors influencing the growth of bacteria in sterilized milk: *Hannah*

dried milk: the effect of the physical characteristics on the solubility and wettability of spray-oiled dry powder: *Hannah*

the effect of long-chain gallates and possibly of other antioxidants on the keeping quality of dried whole milk: *Hannah*

assessment of efficiency of homogenization: *N.I.R.D.*

precision laboratory high-temperature short-time pasteurization: *N.I.R.D.*

time/temperature combinations necessary to destroy *Mycobacterium tuberculosis* in cream: *N.I.R.D.* (in collaboration with *Reading Univ.*)

phosphatase test for efficiency of milk pasteurization (using the experimental precision H.T.S.T. pasteurizer): *N.I.R.D.*

sterilized milk: research on high-temperature short-term treatment, sterilization of bottles or cans and aseptic filling: mechanism and control of cooked flavours; spoilage in sterilized milk: *N.I.R.D.*

organisms concerned in different types of spoilage of sterilized milk, and their control: *N.I.R.D.*

quality of milk

see also Milk Components and their Variability, *page* 72

the influence of the mineral constituents on the protein stability of milk: *Hannah*

establishment of a test for the detection of unsatisfactory keeping quality in sterilized milk: *Hannah*

meaning of overall quality in dairy products, as assessed by experts and by consumers; relative importance to the consumer of different aspects of quality: *Hannah*

studies on creaming of milk: *N.I.R.D.*

studies on colour of milk: *N.I.R.D.*

development of rapid and accurate method for determining density; measurement of conductivity and dielectric constants: *N.I.R.D.*

flavour of milk processed by different methods; possible relation of flavour to consumption of milk in schools: *N.I.R.D.* (in collaboration with *Reading Univ.*)

surface tension of milk in relation to treatment; wetting properties of dried milks: *N.I.R.D.*

rapid tests for acceptance of milk on depot and creamery platforms: *N.I.R.D.*

conveying established research findings to the dairy industry and the dairy farmer; value of different techniques: *N.I.R.D.*

milk rejection test: *N.I.R.D.*

investigation of faults in milk and milk products: *N. Ireland*

sterilization

chemical sterilization: use and efficiency of quaternary ammonium compounds; organization of N.A.A.S. field trials; 'can test' for chemical sterilization; correlation between field trials and 'can test'; screening tests: *N.I.R.D.* (in collaboration with *N.A.A.S.*)

immersion cleaning of equipment; practical technique for use on commercial farms: *N.I.R.D.*

'de-scaling' methods and the efficiency of hypochlorites: *N.I.R.D.*

relation of detergents to prevention of 'milk-stone': *N.I.R.D.*

sterilization of farm water supplies for washing utensils: *N.I.R.D.*

chemical disinfection of dairy equipment: *N. Ireland*

comparison of the efficiency of chemical disinfection of milk equipment: *N. Scot. Coll.*

Wool

methods of fleece measurement; the hair follicle group as the basis of fleece structure; variation and development of medullation and shedding of fibres: *A.B.R.O.*

variation in growth and fleece character of lambs from Blackface ewes mated to various breeds of ram: *A.B.R.O.*

significance of type of birth coat in lambs: *A.B.R.O.*

the relationship between the birth coats of lambs and hardiness: *Exptl. Husb. Farm, Trawscoed*

studies on the weights and types of Blackface fleeces: *N. Scot. Coll.*

study of wool growth and medullation under different nutritional and environmental conditions: *Rowett*

study of fleece characteristics of ewes and lambs on varying nutritional planes: *Rowett* (in collaboration with *Wool Industries Research Association*)

AGRICULTURAL ENGINEERING

Cultivators

technique for testing cultivators and harrows: *N.I.A.E.*

methods for measuring effects of cultivation implements on the soil: *N.I.A.E.*

long-term effects of various mechanical cultivations on crop yields (vegetables) and soil structure: *N.I.A.E.* (in collaboration with *Exptl. Hort. Stns.*)

Dairy Machinery

milking machines—tests of different makes: *Exptl. Husb. Farm, Bridget's* (in collaboration with *N.I.R.D.*)

milking machines—principles of design: *N.I.R.D.*

milk cooling plant: *N.I.R.D.*

testing of dairy machinery and equipment: *N.I.R.D.*

Drying and Storage

electrical drying of agricultural and horticultural products; determination of basic data on crop drying, including moisture equilibria, resistance to airflow, and drying characteristics under various conditions: *E.R.A.*

electrical drying of seeds: *E.R.A.*

experiments with a multi-purpose farm drier: *E.R.A.*

physical and mechanical properties of grain and seed relevant to drying and storage; technique of measuring moisture content; oscillating grain conveyors; heat exchangers for multi-purpose driers; centre dust silo drier; counterflow drying: *N.I.A.E.*

grain cleaners: *N.I.A.E.*

sampling techniques for testing grass and grain driers: *N.I.A.E.*

experiments with a simple batch (tray) drier for grain and study of associated handling problems: *N.I.A.E.* (*Scot.*)

Experimental Machinery

design and development of equipment for agricultural research—fertilizer placement machines, grass plot cutter, laboratory soil grinder, experimental cereal drill: *N.I.A.E.*

Fertilizer Distributors

development of placement machinery: *N.I.A.E.*

techniques for testing distributors: *N.I.A.E.*

Generators

tractor-mounted generators for various electric motor duties: *E.R.A.*

design and testing of small windmills and their utilization in combination with other energy sources: *E.R.A.*

Glasshouse Heating

electric heating of glasshouses: *E.R.A.*

testing and comparison of heating and ventilation systems: *Exptl. Hort. Stns., Efford, Fairfield* (in collaboration with *N.I.A.E.*)

measurements of temperatures and ventilation rates, heat flow through soil and glass, and solar radiation; comparison of different types of heating systems (in collaboration with *Exptl. Hort. Stns., Fairfield* and *Efford*); development of instruments for study of solar radiation and its effect on water requirements of glasshouse crops: *N.I.A.E.*

other references: Glasshouse Climate *under* Meteorology, *page* 12

Harvesting

cereals

causes of grain damage in relation to quality and keeping qualities of wheat and barley: *N.I.A.E.*

application of endless-belt threshing to a combine harvester: *N.I.A.E.*

technique of testing combine harvesters: *N.I.A.E.*

combine harvesting on sloping ground; effect of slope on efficiency of working, and the value of special hillside attachments: *N.I.A.E.* (*Scot.*)

windrow harvesting—examination of different types of windrow; effect on shedding losses; suitability of windrow harvesting for oats grown in wet districts: *N.I.A.E.* (*Scot.*)

green crops

survey of machines in use: *N.I.A.E.* (*Scot.*)

potatoes

factors affecting efficiency of picking potatoes, including effect of different types of conveyor; mechanical factors causing damage to potatoes in harvesting; damage in relation to keeping qualities; time and motion studies of picking associated with elevator diggers, spinners, and complete harvesters: *N.I.A.E.*

development of disc and spider mechanism and its incorporation into a simple complete harvester for the small grower: *N.I.A.E.*

technique for testing harvesters: *N.I.A.E.*

survey of damage to potatoes in harvesting, pitting, grading and transport; picking-belt efficiency under field conditions; development of devices for separating potatoes from stones and clods: *N.I.A.E.* (*Scot.*)

factors affecting grading efficiency; development of improved grader; assessment of damage done by graders and examination of the causes: *N.I.A.E.* (*Scot.*)

design of a stone separator for potato harvesters: *N. Scot. Coll.*

roots

dirt tare investigation on sugar beet: *N.I.A.E.*

development of a simple turnip topper, tailer and windrower: *N.I.A.E.* (*Scot.*)

seeds

problems of harvesting clover and grass seeds: *N.I.A.E.*

Haymaking

design of various types of tripod and rack; techniques of loading; keeping quality of bales made by various types of baler; investigation into different types of haymaking machine: *N.I.A.E.*

problems of mechanizing haymaking in regions of high rainfall; mechanical treatment of swaths to facilitate drying; comparison of rates of drying of hay in different types of rick and on tripods: *N.I.A.E.* (*Scot.*)

Heat Pumps for Farms

design and testing of a heat pump unit for the combined duty of milk cooling and water heating: *E.R.A.* (in collaboration with *N.I.R.D.*)

farm trials of prototype plant: *N.I.R.D.* (in collaboration with *E.R.A.*)

Irrigation Machinery

distribution of water by various spray heads; determination of optimum pressures and spacing: *N.I.A.E.*

investigation of glasshouse watering systems; distribution of water in soil from trickle nozzles; irrigation experiments: *N.I.A.E.* (in collaboration with *Exptl. Hort. Stns.*)

Land Drainage

development of machinery for maintenance of farm ditches: *N.I.A.E.*

laying of continuous field drains (extruded concrete piping): *Unit Soil Physics*

Land Reclamation and Improvement

cultivation of stony ground; comparison of bar-point and conventional ploughshares; trials of equipment for removing large stones from the land: *N.I.A.E.* (*Scot.*)

bracken control and eradication; economic study of mechanical cutting and bruising as means of control (in conjunction with *E.* and *W. Scot. Colleges*); mechanical devices for control of spread; development of a machine for use in final stages of eradication: *N.I.A.E.* (*Scot.*)

Mixing

meal mixing; uniformity of mixing of animal feedingstuffs: *E. Scot. Coll.*

Ploughs

forces acting on plough bodies in the soil and their relation to the physical properties of soils: *N.I.A.E.*

behaviour of tractors with trailed and mounted ploughs on sloping ground: *N.I.A.E.* (*Scot.*)

Seed Drills

technique for testing seed drills: *N.I.A.E.*

Silage

mechanical problems of removal from pits; observations on systems of self-feeding: *N.I.A.E.* (*Scot.*)

Singling Machines

investigation of mechanical thinners for row crops: *N.I.A.E.*

mechanization of sowing and singling of roots grown in drills: *N.I.A.E.* (*Scot.*)

Soil Sterilization

see under Soils, *page* 7

Soil Studies

effect of tractor wheels and tracks on soil structure; mechanical properties of soils in relation to implement performance; relationship between soil stickiness, moisture content, and the dirt tare of root crops: *N.I.A.E.*

Soil Warming

electrical soil warming in open ground and under cloches; effect of soil warming on soil temperatures: *E.R.A.*

Sprayers and Dusters

formation of sprays and their behaviour in air streams and in the open air; development of two-fluid nozzles for concentrate spraying of trees; range of air jets; assessment of deposits: *N.I.A.E.*

examination of corrosion-resistant materials and coatings for machines; causes, results, and elimination of wear of nozzles and pumps: *N.I.A.E.*

deposition and retention of dust particles on crop surfaces; influence of electrical charges on dust behaviour: *N.I.A.E.*

technique for testing sprayers and dusters: *N.I.A.E.*

other references: Dusts *under* Insecticides and Fungicides, *page* 35; Spray Application *under* Insecticides and Fungicides, *page* 36

Tractors

improvement in testing equipment; relation between tractor performance and soil characteristics; performance of tractor wheels; experiments with hydraulically propelled tractor; development of hydraulic motors: *N.I.A.E.*

survey of the mechanical conditions and fuel consumptions of agricultural tractors; collection of data for comparing the efficiency and economics of trailed and mounted implements: *N.I.A.E.*

requirements of a tractor for horticultural use; compaction of seed beds by tractor wheels; factors affecting accuracy of steering: *N.I.A.E.*

behaviour of tractors and cultivating equipment on sloping ground: *N.I.A.E.* (*Scot.*)

Washing Machinery for Vegetables

methods of reducing effective water usage; collaboration with *D.S.I.R.* in studies of deterioration of washed vegetables: *N.I.A.E.*

Weed Control

see Weeds and Weedkillers, *page* 37

Work Studies

farm survey of methods employed in handling farmyard manure and silage; comparison of labour and machine requirements; similar studies on other operations: *N.I.A.E.*

STATISTICS

Biometry

studies of variation in fruit plants as a basis for experimental design; field uniformity trials providing data for pomological interpretation of measurable characters and for reduction of experimental error: *E. Malling*

assessment of vigour and correlation with crop weight in soft fruits; methods of sampling bushes and trees for infestation by pests and diseases; greenhouse uniformity trials: *Long Ashton*

Design and Analysis of Experiments

experiments with fruit plants and tree crops generally, including design, analysis and advice for the N.A.A.S.: *E. Malling*

changing of treatments in a long-term trial; designing trials to make use of outside trees; interpretation of trials in which the experimental unit is part of the plant: *E. Malling*

design and interpretation of laboratory experiments such as tests of insecticides and fungicides: *E. Malling*

grassland experiments, including those with animals: *Grassland R.S.*

experiments with fruit plants; design of greenhouse pot experiments: *Long Ashton*

layout of animal experiments and efficiency of techniques, particularly with dairy cattle and pigs; value of identical twins: *N.I.R.D.*

pasture evaluation in animal terms; economical use of large animals; variability studies: *N.I.R.D.*

experiments with vegetable crops; the relative contributions of various factors to experimental error in vegetable experiments: *N.V.R.S.*

advisory work and practical design and analysis of crop experiments for the *N.A.A.S.*; analysis of Rothamsted experiments including accrued results of long-term experiments; advice on colonial experiments; design and conduct of animal experiments; summaries of existing results on fertilizer responses and cultural practices: *Rothamsted*

experiments with dairy cattle and other farm and experimental animals: *Rowett*

grass-strain sward trials in co-operation with Scottish Colleges; sugar beet spacing trials (with *British Sugar Corporation*); comparative trials of clonal potato stocks (with *Pl. Reg. Stn.*); miscellaneous agricultural and horticultural experiments: *Unit Stat.*

Sample Surveys and Operational Research

surveys of fertilizer practice, diseases in dairy herds, maternal mortality in sheep (Yorkshire) and mortality and growth rate of lambs; advice on colonial surveys; research into sampling theory: *Rothamsted*

survey of relationship between growth of cattle and dietary constituents, using data supplied by Commonwealth Bureau of Animal Nutrition: *Rowett*

long-term study of solids-not-fat content of milk from the *N. Scot. Coll.* dairy herd: *Unit Stat.*

surveys of fertilizer practice in Scotland: *Unit Stat.*

sample survey for the study of calf mortality in N.E. Scotland: *Unit Stat.* (in conjunction with *N. Scot. Coll.*)

Statistical Methods

distributions and transformations applicable to ecological data; assessment of short-term changes in yield and other multivariate problems: *Grassland R.S.*

sequential analysis of feed-intake data for dairy cows: *Hannah* (in collaboration with *Sir Ronald Fisher*)

analysis of old data bearing on the effect of orchard factors on keeping quality of fruit: *Long Ashton*

estimation problems in truncated negative binomial populations: *Long Ashton*

planning and analysis of new methods for bio-assays: *N.I.R.D.*

statistical problems connected with analysis of hereditary characters showing continuous variation: *N.V.R.S.*

use of electronic computer for routine statistical analyses and for other analytical purposes; development work on the machine: *Rothamsted*

theory of plant selection and planning of variety trials; cross-over designs and related problems; bio-assay problems: *Unit Stat.*

analysis of experiments when data are truncated response times; construction of serially balanced sequences; test for association in ordered sequences: *Unit Stat.*

estimation of variance components: *Unit Stat.*

ANIMAL INDEX

ANIMAL INDEX

Whereas the subject index is exhaustive, the animal index only contains part of the work relating to any particular animal; reference should, therefore, be made to the appropriate sections of the subject index.

CATTLE

Breeding, Genetics and Reproduction

genetics

purebreeding *v.* cyclical crossing of Jersey, Ayrshire and Friesian cattle; studies on twins; performance of two-egg twins on commercial farms: *A.B.R.O.*

breeding of poll brown and white Ayrshire cattle: *Compton*

genetics of beef and milk production in dual-purpose cattle: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

pilot scheme to stimulate the progeny testing of Friesian A.I. bulls for beef; an analysis of contemporary comparisons in evaluating bulls in natural service (with *M.M.B.*); analysis of results of different methods of progeny testing dairy bulls: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

pilot scheme to investigate a system of bull-breeding using A.I.; inheritance of dairy characteristics in British breeds: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

inheritance of solids-not-fat in milk; genetic differences between bull breeding herds; the compatibility of milk and beef—analysis of data from Danish testing stations: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

breeds and crosses for beef production: *Exptl. Husb. Farms, High Mowthorpe, Rosemaund*

observations on suitability as breeding stock on hill farms of Highland and Highland cross cows; comparison of Highland with Galloway cows and their calves by a Shorthorn bull and of Highland × Shorthorn with Galloway × Shorthorn cows and their calves by an Aberdeen Angus bull: *Hill Farm. R.O.*

a comparison of different breeds for producing beef from the hills: *N. Scot. Coll.*

correlation of breeding with health and production records of Ayrshire cows: *W. Scot. Coll.*

reproduction

antibiotics and the bacteriology of bovine semen; a laboratory test for the fertilizing quality of semen: *N.I.R.D.*

methods for storage of semen at very low temperatures: *Unit Repr. Phys.*

trichomoniasis in cattle in relation to A.I. practice: *Weybridge*

Diseases and Disorders

acetonaemia

bovine acetonaemia: *Bristol Univ., Dept. of Physiology* (R.G.)

biochemistry of pregnant and lactating cows especially in relation to ketosis: *Liverpool Univ., Dept. of Veterinary Biochemistry* (R.G.)

a study of the steroids in the urine of pregnant mares, pregnant and lactating cows, non-pregnant and gonadectomized goats; abnormalities of steroid metabolism in the cow: *London Univ., Postgraduate Medical School* (R.G.)

routine milk sampling to pick out early cases to see if treatment of these will prevent symptoms developing: *N. Scot. Coll.*

bloat

preliminary observations on bloat: *Compton*

survey of bloat in cattle: *W. Scot. Coll.*

bracken poisoning

bracken poisoning: *Rowett*

effects on animals of products of bracken thiaminase acting on vitamin B, and different cofactors: *Univ. Coll. N. Wales, Dept. of Agric. Chemistry* (B.G.)

clinical and pathological features in experimental bracken poisoning: *V.I. Centres*

brucellosis

value of the ring test in diagnosis (in collaboration with *Weybridge* and *Public Health Laboratories*); non-specific factors influencing the ring test; antibodies in the blood of vaccinated and infected cattle; immunization of laboratory animals and cattle using adjuvant and fraction antigens: *Compton*

strain 19 *Br. abortus* vaccine—development of technique for large-scale production in serated liquid culture: *Lasswade*

studies on the immunization of guinea pigs to *Br. abortus* infection with adjuvant vaccines: *Moredun*

immunological studies in brucellosis: *N. Ireland*

strain 19 *Br. abortus* vaccine—research on freeze-drying; the meaning and stability of the species of *Brucella* and of colonial types; methods of estimation of the virulence of *Brucella*; the ring, plate and other serological tests; comparison of the immunity produced in guinea pigs

by killed 'rough' and 'smooth' cultures of *Brucella* in adjuvants: *Weybridge*

international reference work on identification, mono-specific sera, standard *Brucella* agglutination serum and antigens for tube and ring tests: *Weybridge*

a study of *Brucella* variants: *Weybridge*

calf scours

investigation of serological types of *Bacterium coli* and their relationship to diseases of animals, especially calf scours and coliform mastitis in cattle: *London Univ., Royal Veterinary College* (R.G.)

copper deficiency

see mineral metabolism (copper), *page* 77

cryptorchidism

incidence of cryptorchids in the progeny of a cryptorchid bull; growth of freemartins as compared with normal twin males and females: *A.B.R.O.*

fluorosis

effect of fluorine on bone metabolism: *Leeds Univ., Dental School* (R.G.)

fluorosis in cattle: *W. Scot. Coll.*

assessment of the frequency of fluorosis and degree of production losses in the industrial areas involved: *Weybridge*

freemartins

see cryptorchidism, *above*

husk

see lungworm infestation, *below*

Hydrops foetalis

see Inheritance of Abnormalities, *page* 58

hypomagnesaemia

incidence of hypomagnesaemic trouble and control by addition of magnesium compounds to grass and silage: *E. Scot. Coll.*

studies of magnesium metabolism in calves and older cattle using radioactive magnesium: *Hannah*

feeding of herbage known to induce hypomagnesaemia; fractionation of the herbage and identification of the factor responsible; examination of the suitability of small laboratory animals for testing: *Moredun*

the effect on the absorption and excretion by sheep of magnesium and calcium and on water balance of ammonium salts, potassium salts, ion exchange resins, porphyrins and other chelating agents: *Moredun*

relation of grassland management to hypomagnesaemia, to grass tetany and other metabolic disorders: *N.I.R.D.*

magnesium metabolism of the milk-fed calf: *N.I.R.D.*

measures aimed at preventing hypomagnesaemia in cattle and sheep: *N. Scot. Coll.*

investigation of the effects of various manurial treatments of pasture on the incidence of hypomagnesaemia in adult cattle; the value of magnesium-containing manures as a means of prevention; comparison of calcined magnesite and dolomite; analyses of 'tetany-prone' and normal pastures; studies of the 'digestibility' of magnesium in different pastures: *Weybridge*

factors concerned in the depletion of magnesium and in the production of tetany in calves fed on rations consisting mainly of milk; prophylactic feeding of magnesium supplements; magnesium levels in cows receiving magnesium by mouth: *Weybridge*

infertility

see also brucellosis, placentitis, trichomoniasis, vibriosis *in this section*; Infertility, *page* 93

sterility in A.I. bulls; the importance of feminism and testicular atrophy: *E. Scot. Coll.*

survey of factors concerned in infertility in cattle: *A.I. Group*

studies on various aspects of abortion and infertility; abortion due to infective agents other than those recognized at present; causes of infertility which lead to culling from the herd; surveys into causes of herd infertility: *V.I. Centre*

intestinal parasites

intestinal parasites of hill cattle: *W. Scot. Coll.*

Johne's disease

comparative susceptibility of young and adult cattle to Johne's disease; standard infective dose; immunity; effect of vaccination on usefulness of the tuberculin test: *Compton*

epidemiology and diagnosis of the disease in cattle and sheep: *E. Scot. Coll.*

congenital infection with Johne's disease; survey of incidence and importance of Johne's disease; correlation of faecal findings with complement fixation test and P.M. examination; immunity induced by an atypical strain of *Mycobacterium johnei*: *Glasgow Univ., Veterinary School* (R.G.)

development of methods to measure the growth of *M. johnei*: *Moredun*

studies on the virulence of *M. johnei*: *Moredun*

development of methods to assess immunity and hypersensitivity to *M. johnei* using guinea pigs, rabbits, mice, sheep and tissue culture techniques: *Moredun*

serological tests for Johne's disease: *Moredun*

investigation of cross-immunization between *M. johnei* and *M. tuberculosis* (avian): *Moredun*

diagnosis of Johne's disease: *N. Ireland*

eradication of infection by blood testing and slaughter (in collaboration with *Weybridge*): *V.I. Centre*

isolation of *M. johnei* from bovine foetuses of clinical and preclinical cases: *Weybridge*

immunity tests with different types of Johne's vaccine on bovines and goats; vaccination field trial; the value of the complement test in diagnosis and a field trial on its use as a basis for eradication of the disease from infected herds: *Weybridge*

lungworm infestation

a study of the effects of age at which the animal is first exposed to husk: *Exptl. Husb. Farm, Boxworth*

a study of the fundamental serological and cellular changes associated with immunity to helminth diseases, especially lungworm infestation; the possibility of an immunological approach to prophylaxis: *Glasgow Univ., Veterinary School* (R.G.)

effect of level of worm infestation on the survival and availability to the grazing animal of lungworm larvae: *Grassland R.S.*

assessment of the value of new compounds in the treatment of natural and experimentally infected calves: *V.I. Centre*

parasitic bronchitis in bovines: epidemiology (including immunological relationships) and control; association with grazing behaviour: *Weybridge*

mastitis

determination of the relative therapeutic value of antibiotics in the treatment of bovine mastitis and other bacterial diseases; investigation of pathogenesis, pathology and immunology of mastitis; typing of streptococci and staphylococci; typing of staphylococcal mastitis with bacteriophage: *Compton*

histopathology of udders from cows cast from the Institute herd (udders which pose some problem such as resistance to treatment, or persistent high cell counts without mastitis organisms in the milk); the effect of sub-clinical mastitis on the yield of individual quarters through more than one lactation; the maintenance of a mastitis-free herd; control of sub-clinical mastitis by antibiotic treatment; the bacteriology and pathology of sub-clinical mastitis: *Hannah*

observations on the incidence and the effect on production of the different types of mastitis in twin heifers: *Lasswade* (in collaboration with *A.B.R.O.*)

management and udder infection; influence of vacuum level; methods of 'drying-off' in relation to udder infections; dry-period infections: *N.I.R.D.*

eradication of *Streptococcus agalactiae* infection by repeated testing of milk and the treatment of infected animals: *V.I. Centre*

treatment of mastitis: *W. Scot. Coll.*

field trial of *Str. agalactiae* vaccine; field trial of a new disinfectant for controlling the spread of *Str. agalactiae* in herds where chronic infection exists: *Weybridge*

preliminary experiments on intramammary vaccination with killed staphylococcal vaccines; epidemiology of staphylococcal mastitis; phage typing; isolation of staphylococci from various parts of the cow and its environment; investigation of using adequately disinfected milking units in controlling spread of infection; study of the organisms in mastitis of dry cows: *Weybridge*

source of *Corynebacterium pyogenes* infections; experimental transmission by flies; vaccination experiment in dry cows; field trials on new mastitis therapeutic agents; field trials on the effect of milking techniques on the incidence of mastitis; methods for disinfecting milking units suitable for use in the cowshed after milking each cow: *Weybridge*

muscular dystrophy

vitamin E in calf nutrition studies; the effect of the potassium content of the diet on muscular degeneration in calves: *Hannah*

vitamin E content of different types of silage made at different times of the season: *N. Scot. Coll.*

parasitic bronchitis

see lungworm infestation, *above*

parasitic gastroenteritis

see intestinal parasites, *above*

placentitis

the pathology of placentitis; permeability of the infected placenta; defence mechanisms of the conceptus against infection; placentitis induced by *Br. abortus* and other agents: *London Univ., University Coll. Hosp. Med. School* (*V.R.F.*)

pneumonia in calves

see also lungworm infestation, *above*

a study of pneumonia in calves: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.)

ringworm infection

see Fungi and Fungal Diseases, *page* 85; Incidence of Disease, cattle, *page* 93

tuberculosis and tuberculin

investigation of strains of tubercle bacilli of obscure or possibly human origin; culture of the flora in skin tuberculosis; investigation of the sensitizing of guinea-pigs to tuberculins by saprophytic acid-fast bacteria: *Lasswade*

preparation of a tuberculin with maximum reactivity in the tuberculous animal and minimum reactivity in the uninfected, non-specifically sensitized animal; attempts to identify the antibodies present in serum at various stages of infection, particularly in animals which have become negative to the skin test: *Weybridge*

identification and classification of acid-fast bacilli in normal animals; the effect on tuberculin sensitivity in calves of the superimposing of acid-fast infections; acid-fast infections of bovines other than tuberculosis and Johne's disease; *Weybridge*

vibriosis

typing of *Vibrio foetus*; pathogenicity of these strains for laboratory animals; immunological studies: *Compton*

study of a condition similar in clinical nature to vibriosis but apparently caused by a virus: *Weybridge*

warble-fly

attempted infestation of laboratory animals with warble-fly: *Weybridge*

Feeding

general

the development of marker and faeces collection methods for assessing the amount, digestibility and ultimate manurial value of the herbage consumed by cows: *Hannah*

effect of dietary changes in utilization of food by the cow: *N.I.R.D.*

indoor and outdoor feeding of store and fattening cattle: *Rowett*

calf nutrition

growth of calves when whole milk is largely replaced by milk substitute gruels: *Exptl. Husb. Farms, Boxworth, Bridget's, Trawscoed*

vitamin E in calf nutrition studies: *Hannah*

vitamin metabolism of pre-ruminant calf: *N.I.R.D.*

feeding of grass and grazing

output of milk from grass alone: *Exptl. Husb. Farm, Bridget's* (in collaboration with *N.I.R.D.*)

effect of varying levels of nitro-chalk on yield and composition of sward and on milk from dairy cows; effect of feeding carbohydrate supplement to dairy cows at grass: *Exptl. Husb. Farm, Bridget's* (in collaboration with *N.I.R.D.*)

study of intensive grassland problems with the aim of obtaining high output per cow: *Hannah*

intensive grass production to provide complementary grazing in spring and autumn and hay and silage for winter feeding of the outwintered herd: *Hill Farm. R.O.*

pasture composition in relation to animal production using dairy cows both grazing and housed in metabolism stalls: *Rowett*

the technique of experiments on the grazing animal, particularly the estimation of herbage consumption: *Rowett*

feeding of other materials

the feeding of home-grown bulky foods to dairy cows in winter: can calves reared on a bulky diet make better use of bulky feeding stuffs?: *Exptl. Husb. Farm, Great House*

carbohydrate components of bulky farm foods, their analysis, utilization by the cow and contribution to the volatile acid metabolites; the nutritive value of home-grown foods as shown by digestion efficiency; estimation of changes in body fat; effect of dietary changes on chemical and physical conditions in the rumen: *N.I.R.D.*

types of grass silage and methods of use, for the winter fattening of bullocks: *N. Ireland*

the optimum stage for cutting green oats for silage for maximum yield, judged by fattening of cattle: *N. Scot. Coll.*

feeding value of silage and other fodders for beef production: *Rowett*

plane of nutrition

comparison of production of milk from and duration of milking life of cows reared on different planes of nutrition: *Exptl. Husb. Farms, Boxworth, Bridget's, Trawscoed*

the effects of level of nutrient intake and composition of the ration upon milk yield and quality: *Exptl. Husb. Farm, Bridget's* (in collaboration with *N.I.R.D.*)

the effects of the plane of nutrition on the butterfat and solids-not-fat in milk; the effects of varying planes of nutrition during the rearing period on the growth, yield and health of dairy cattle; the effect of the plane of nutrition of the dam on the growth rate of calves: *Rowett*

winter feeding

the progress of steers outwintered on foggage: *Exptl. Husb. Farm, Gleadthorpe*

comparison of different methods of turning out calves on to pasture in the spring: *Exptl. Husb. Farms, Boxworth, Bridget's, Trawscoed*

investigation of the check in liveweight gain in cattle on spring grass following wintering in yards and outwintering: value of winter grazing for beef stores: *Grassland R.S.*

influence of diet on health, growth and development of calves; the extent to which roughages can replace concentrates; raising calves on grass: *N.I.R.D.*

effect of antibiotics on growth rate in calves: *N. Ireland*

Management
see Feeding, *above*

general
behaviour of herbivorous animals; free choice selection of mineral substance by cattle: *Compton*

the effect of mineral supplementation on milk production and composition: *Hannah*

the relationship between growth of cattle under different managements and types of feeding and the different dietary constituents fed them: *Rowett*

correlation of subsequent milk yield with prior assessment, by palpation, of udder tissue: *W. Scot. Coll.*

calf management
various methods of rearing, indoors and outside on pasture: *Grassland R.S.*

calf mortality; survey and control in dairy herds: *W. Scot. Coll.*

housing
see also Environmental Physiology, *page* 78

investigation into systems of cattle housing: *E. Scot. Coll.*

comparison of various bedding materials; cost and effectiveness of straw as compared with lime and sawdust: *Exptl. Husb. Farm*

Milk Quality and Yield
see Milk and Dairying, *page* 98; Physiology of Lactation, *page* 71

PIGS

Breeding, Genetics and Reproduction

genetics
the possibility of using inbred lines and their crosses as an alternative to purebreeding or crossbreeding of Large White and Wessex Saddleback pigs: *A.B.R.O.*

incidence and inheritance of abnormalities: *A.B.R.O.*

crossbreeding for rate of growth, food conversion and carcass quality: *Exptl. Husb. Farms, Terrington, Trawscoed*

comparison of the progeny of Large White and Landrace boars on Wessex Saddleback sows: *Exptl. Husb. Farm, High Mowthorpe*

interactions of heredity and environment in the fattening and carcass quality of bacon pigs: *N. Ireland*

breeding and feeding of pigs in relation to carcass quality: *W. Scot. Coll.*

reproduction
semen characteristics of boars during development: *A.B.R.O.*
development of techniques for A.I. in the pig: *Unit Repr. Phys.*

Diseases and Disorders

anaemia
see also haemolytic disease, *below*
piglet anaemia: *Glasgow Univ., Veterinary School* (R.G.)
effect of nutritional anaemia on pre-weaning growth in pigs: *N. Ireland*
comparison of methods of prevention: *N.I.R.D.*

atrophic rhinitis
see rhinitis and encephalitis, *below*: *Weybridge*

Aujesky's disease
see page 87: *Weybridge*

bowel oedema
studies on haemolytic coliform organisms isolated from case of bowel oedema: *N. Ireland*
serology of organisms isolated; reproduction of the disease: *Weybridge*

copper toxicity
an investigation of copper toxicity: *Weybridge*

enteritis
special investigation of the problem of enteritis in pigs: *V.I. Centre*

foot and mouth
see page 88: *Pirbright*

haemolytic disease
see Immunology, blood groups, *page* 92: *Cambridge Univ.*

leptomeningitis eosinophilica
see page 91: *Weybridge*

lungworms
the role of lungworms as a first or second cause of pneumonia: *Compton*

neonatal mortality
see Investigation of Neonatal Period, *page* 94: *Cambridge Univ.*

nervous diseases
see Pathology of Various Organs and Systems, *page* 94: *Weybridge*

pneumonia
serological methods for detecting lung diseases in pigs: *Compton*
study of pathogenesis of virus pneumonia and other pneumonic conditions; systematic study of various aetiological agents responsible for pneumonia conditions: *Compton*

pathology of pneumonia: *Glasgow Univ., Veterinary School* (R.G.)

a study of methods for the establishment of a virus-free herd: *Harper Adams*

effect of ultra-violet radiation in fattening houses: *W. Scot. Coll.*

pre-natal mortality
see Infertility, *page* 93: *Babraham*

rhinitis and encephalitis
a study of transmission, aetiology and pathology: *E. Scot. Coll.*

investigation of atrophic rhinitis, including body rhinitis and other diseases of the pig snout: *Weybridge*

swine erysipelas
see page 83: *Weybridge*

swine fever
comparison of the anticoagulant effect of heparin and dextran sulphate in guinea-pigs in relation to crystal violet vaccine production: *Lasswade*

histology of brain changes in relation to diagnosis; serological diagnosis: *Weybridge*

experiments on the properties and use of lapinized virus: *Weybridge*

tissue culture studies: *Weybridge*

field trial on the use of lapinized swine fever virus to control outbreaks of the disease: *Weybridge*

association of swine fever with birth of abnormal piglets: *Weybridge*

vesicular exanthema
see page 89: *Pirbright*

Feeding
see also Alimentary Physiology and Nutrition, *page* 63

growth-promoting effects of antibiotic substances—experiments with pigs, calves and foals: *Compton*

effect of pig grazing on the persistency of lucerne, white clover, perennial ryegrass, timothy and meadow fescue, and the saving of meal that can be obtained by grazing sows and growing pigs: *Grassland R.S.*

artificial rearing and early weaning of baby pigs; value of creep meal for suckling pigs; requirements for vitamins and inter-relationship between nutrients; effect of food additives on performance: *N.I.R.D.*

labour saving in pig feeding; scales of feeding; water requirements; use of dairy by-products; mode of action of antibiotics in food; high copper feeding: *N.I.R.D.*

dietary studies in relation to the artificial rearing of pigs: *N. Ireland*

growth-promoting effects in pigs of antibiotic substances; interaction of antibiotics and B vitamins; effect of endocrine substances on growth and carcass conformation in pigs; effect of high levels of copper salts in the food on growth and carcass quality in pigs; high and low energy diets in relation to growth and carcass quality in pigs: *N. Ireland*

studies of the metabolism of the young pig: *Rowett*

the economical use of home-produced feeds for pigs under different methods of husbandry; investigations of the nutrition of sows during growth and lactation; problems associated with the energy-nutrition of bacon pigs: *Rowett*

Management

see also Feeding, *above*

the relationship of the feeding and management of sows to the health and survival rate of litters: *Glasgow Univ., Veterinary School* (R.G.)

comparison of indoor and outdoor farrowing; effect of restricted water on daily liveweight increase and food conversion of fattening pigs; assessment of the correlation between the behaviour of the pig and its environment: *Harper Adams*

environmental studies of pigs: *N. Ireland*

relationship between growth rates at various ages and the carcass quality of bacon pigs: *N. Ireland*

problems associated with the weaning of baby pigs from the sow at an early age; aseptic farrowing to produce stock free from atrophic rhinitis, virus pneumonia, etc.: *Rowett*

POULTRY

(FOR TURKEYS AND DUCKS SEE END OF THIS SECTION)

Breeding, Genetics and Reproduction:

see also Animal Breeding and Genetics, Animal Physiology (Animal Reproduction) and Incubation and Hatching, *below*

autosexing breeds

breeding of autosexing poultry: *Compton*

form and function correlations

see Inheritance of General Characters, *page* 58; *Poultry R.C.*

reproduction

correlations between laboratory tests and fertilizing capacity of fowl semen: *Houghton*

components in avian semen and their effects on storage; site of fertilization when frozen semen is used; the addition of diluents before or after deep-freeze treatment: *Houghton*

effect of drugs on reproduction: *Houghton*

the relation between sexual activity of the hen and egg production: *Poultry R.C.*

investigation of the causes of differences in the libido of cocks: *Poultry R.C.*

effect of hormone therapy on the libido of sexually low grade and old cocks: *Poultry R.C.*

examination of secretions from the male reproductive tract and their significance for storage *in vitro*: *Poultry R.C.*

Breeding Systems

closed flock purebreeding based on family merit: *E. Scot. Coll.*

a study of selection procedure and mating system designed for the improvement of poultry for meat production: *Harper Adams*

the long-term effects of a system of family selection of stock for egg production: *Harper Adams*

an analysis of records to see the effectiveness of progeny testing of males and hen families: *Harper Adams*

the effects of continuous breeding under intensive conditions of housing: *Harper Adams*

elaboration and testing of a method of family selection in flocks of R.I.R. and Light Sussex birds: *London Univ., Wye College* (R.G.)

heritability and genetic correlations of commercially important traits in the laying hen: *N. Ireland*

hereditary and other factors affecting the laying hen's efficiency of food conversion: *N. Ireland*

heterosis in poultry in pure line crosses and repeated back crosses to one parent line: *Poultry R.C.*

studies of breeding management and feeding in relation to poultry production: *W. Scot. Coll.*

Diseases and Disorders

see also Animal Pathology, *page* 79

arterio-sclerosis
see Pathology of Various Organs and Systems, *page* 94: *Weybridge*

Ascaridia
see Nematodes and Nematode Infestation, *page* 85: *Houghton*

Aspergillus
see Fungi and Fungal Diseases, *page* 84: *Houghton*

Candida
see Fungi and Fungal Diseases, *page* 84: *Houghton*

cerebellar hypoplasia
see Inheritance of Abnormalities, *page* 58: *Weybridge*

cestodes
see page 84: *Houghton*

coccidiosis
characters of highly pathogenic intestinal coccidia and their relationship to the epidemiology of the associated diseases; effects of different intensities of parasitism; chemotherapeutic studies of infections derived from single-cell inocula; study of acquired immunity; effects of diet on coccidiosis: *Houghton*

epidemiology of coccidiosis in deep-litter houses with particular reference to intestinal forms: *Weybridge*

immunology and chemotherapy of caecal coccidiosis and histomoniasis in poultry: *Weybridge*

crazy chick disease
see vitamin E, *page* 68: *Weybridge*

crooked toes
see Diseases of Uncertain Aetiology, *page* 90: *Houghton*

curled tongue
see Inheritance of Abnormalities, *page* 58: *Lasswade*

ectoparasites
see Arthropod Parasites, *page* 79: *Houghton*

epidemic tremor
see infectious avian encephalomyelitis, *page* 88

fowl typhoid
ecology of the causal organism; use of attenuated live vaccines; therapeutic effect of furazolidone on adult carriers: *Lasswade*

controlled trials with two types of attenuated live vaccines: *V.I. Centre*

haemorrhagic syndrome
see Pathology of Various Organs and Systems, *page* 94: *Houghton*

Heterakis
see Nematodes and Nematode Infestation, *page* 85: *Houghton*

histomoniasis
chemotherapy; immunity development of the *Histomonas*/*Heterakis* relationship; search for a practicable disinfectant against *Heterakis* ova in the field nutritional aspects: *Houghton*

life history and transmission with particular reference to *Heterakis*; chemotherapy: *Weybridge*

infectious avian encephalomyelitis (epidemic tremor)
see page 88: *Weybridge*

leucosis complex
the normal haematology of the chick and the effect on it of B vitamins and analogues of these; the ribonucleic acid and desoxyribonucleic acid contents of normal and neoplastic tissues and the respiration and glycolysis of these tissues: *Houghton*

the effects of tumour-inhibitory compounds: *Houghton*

comparative histopathology of lymphoid leucosis: *Lasswade*

investigations into the biology and biochemistry of viruses causing cancer and leukaemia in fowls; genetics of resistance and susceptibility to these viruses; studies of the 'eclipse phase' in the multiplication of fowl leukaemia virus subsequent to infection: *Poultry R.C.*

the long-term effects in fowls of sub-lethal amounts of certain alkaloids with special reference to the development of liver cancer: *Poultry R.C.*

pecking

see Alimentary Motility and Secretion, *page* 63: *Poultry R.C.*

pullet disease and avian nephritis

pathology of the avian kidney and its relationship to clinical conditions: *Houghton*

the production of allergic nephritis experimentally: *Poultry R.C.*

research in aetiology: *Weybridge*

pullorum disease

analyses of toxic fractions from cultures of *Salmonella pullorum* by diffusion techniques: *Houghton*

investigation of unusual outbreaks of non-specific reactions to the blood test: *Weybridge*

the value of furazolidone in the treatment of adult carriers of *Salmonella* infection, particularly pullorum disease: *Weybridge*

respiratory diseases

respiratory diseases of poultry: *Cambridge Univ., Dept. of Animal Pathology* (R.G.)

search for known and unknown infectious agents in outbreaks of chronic respiratory disease (C.R.D.); relationship between C.R.D. of chicks and infectious sinusitis of turkeys: *Cambridge Univ., Dept. of Animal Pathology* (R.G.)

isolation and typing of PPLO from chickens with and without C.R.D.: *Cambridge Univ., Dept. of Animal Pathology* (R.G.)

general investigation of possible types of PPLO and work on haem-agglutination test: *Lasswade*

aetiology of respiratory disease in poultry: *Liverpool Univ., Dept. of Vet. Preventive Medicine* (R.G.)

detailed study of a single strain of causal organism: *Weybridge*

roundheart disease

an investigation of roundheart disease in poultry: *Houghton*

attempts at transmission: *Lasswade*

toxic substances

investigation of the toxicity of the newer rodenticides and organic phosphorus insecticides; the possible toxicity to wild birds, game and

domestic poultry of insecticides, etc. used as dressings for seed corn: *Weybridge*

tumours

see leucosis complex, *above*; Pathology of Various Organs and Systems, *page* 94: *N. Ireland*

Egg quality

to ascertain whether quality as measured by candling is linked to individual birds and/or system of housing: *Exptl. Husb. Farm, Gleadthorpe*

mechanism whereby bacteria gain access to eggs, embryos and chicks: *Houghton*

microbiology of eggs and egg products: *N. Ireland*

investigation of cleaning of eggs in relation to keeping quality under different storage conditions; methods of heat-treatment for whole shell and liquid egg to improve keeping quality: *N. Ireland*

study of the hen egg shell: *Reading Univ., Dept. of Agric. Chemistry* (R.G.)

Feeding

nutrition and disease

the influence of diet on the susceptibility of chickens to bacterial and protozoal infections: *Houghton*

vitamin E deficiency: *Lasswade*

nutrition and metabolism

see also Alimentary Physiology, *page* 63

effect of different methods of feeding pullets on initial egg production: *Exptl. Husb. Farm, Trawscoed*

the efficiency of a protein concentrate pellet (at 10 %) in a diet of mixed whole grains: *N. Ireland*

the influence of energy levels, in battery hens' diet, on food conversion: *N. Ireland*

determination of optimal nutritive ratio for egg production when a diet high in available energy is fed; similar digestibility trials using diets low in energy: *Poultry R.C.*

studies of the utilization of dietary protein and energy by poultry, pigs and sheep: *Rowett*

studies of the requirements of pigs and poultry for amino acids and vitamins during growth and reproduction: *Rowett*

the effect of amino-acid balance and protein quality in the utilization of dietary energy by poultry: *Rowett*

Housing and Environment

optimum relative humidity for the brooding of chicks: *E.R.A.*

the effect of temperature control in deep litter houses: *Exptl. Husb. Farm, Great House*

ecology of built-up litter: *Houghton*

experiments on productivity of hens under a controlled environment: *Poultry R.C.*

Incubation and Hatching

the practicability of fortifying hatching eggs with vitamins A, B_2, B_{12}, D_3 by external treatment: *Harper Adams*

the use of aerosols for surface sterilization; possible use of furfuraldehyde in a kerosene base and with formalin: *Houghton*

causes of increase in early embryonic mortality when maintaining fertility during the period of normal decline in poultry: *Houghton*

fumigation with furfural and formalin; estimation of bacterial populations in incubator rooms: *Lasswade*

the effect of storage of eggs before incubation on growth of embryos: *Poultry R.C.*

the effect of incubator practice on hatching percentage: *Reading Univ., Dept. of Agriculture* (R.G.)

the depressant effect of rations containing large amounts of fish meal on hatchability in breeding hens: *Reading Univ., Dept. of Agriculture* (R.G.)

investigation of poor hatchability; relationship between incubator and hatchery conditions and rearability of the chick: *Weybridge*

Lighting

length and timing of flashes for optimum winter egg production for birds in cages and in folds: *E.R.A.*

influence of temperature and lighting in chick brooding: *E.R.A.*

flash illumination of laying poultry: *E.R.A.*

effect of light, nutrition and breed on growth and feed efficiency of young birds to table weight: *Reading Univ., Dept. of Agriculture* (R.G.)

the effect of light and nutrition on the occurrence of sexual maturity and onset of lay in pullets: *Reading Univ., Dept. of Agriculture* (R.G.)

Management

see also Feeding, *above*

general

comparison of different methods of management for egg production: *Exptl. Husb. Farm, Gleadthorpe*

effect of systems of poultry management on the clover content of a mixed sward; effects of systems of management on the botanical composition and palatability of swards sown to one or two species: *Grassland R.S.*

studies on the husbandry of the caged bird: *Harper Adams*

costing and marketing

the cost of brooding and rearing pullets in autumn and spring under intensive and extensive conditions: *Harper Adams*

the cost of producing broiler chicks under intensive and extensive systems of housing: *Harper Adams*

the cost structure of egg production under various systems of intensive and extensive housing: *Harper Adams*

studies in the processing and packaging of poultry: *Harper Adams*

TURKEYS AND DUCKS

Breeding, Genetics and Reproduction

experiments on dilution and storage of turkey semen: *Houghton*

inheritance in turkeys of sexual maturity and semen production: *Houghton*

Disease and Disorders

coccidiosis in turkeys

review of species of coccidia occurring in turkeys and investigation by single-cell inocula: *Houghton*

investigation of coccidiosis in turkeys: *Liverpool Univ., Dept. of Vet. Preventive Medicine* (R.G.)

duck hepatitis

see page 87: *Weybridge*

duck septicaemia

see page 81: *Weybridge*

non-specific haemorrhagic enteritis in turkeys

see Pathology of Various Organs and Systems, *page* 94: *Houghton*

Feeding and Nutrition

the value of the main cereal grains, oats, wheat, barley and maize in the rearing and fattening diets of turkeys: *N. Scot. Coll.*

Management

the cost of producing turkeys brooded and reared under intensive or extensive systems of housing: *Harper Adams*

the response of turkeys to hexoestrol implantation: *N. Scot. Coll.*

SHEEP

Breeding, Genetics and Reproduction

genetics

selection for and against hairy birth coats: *A.B.R.O.*

performance of progeny of 'pedigree' and 'mountain' type of ram; inheritance of fleece weight and other characters in Blackface and Wiltshire crosses: *A.B.R.O.*

performance of Blackface, Swaledale and crosses; performance of various types of cross lambs out of cast Blackface ewes: *A.B.R.O.*

study of characters of Tasmanian Merinos: *A.B.R.O.*

effect of selection in Blackface sheep: *A.B.R.O.*

assessment of genetic correlation between milk and body size in sheep, from Italian data: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

genetic variation in various characters of a flock of Scottish Blackface sheep, including resistance to helminth infestation: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

see also Systems of Breeding, general, *page* 61: *Exptl. Husb. Farms*

comparison of North and South Country Cheviots; Lanark, Lewis and Newton Stewart and Home-bred types of Blackface; Lanark, Lewis and Newton Stewart rams; selection of Blackface sheep for conformation and nursing ability; selection of Cheviot sheep for milk yield and lamb growth: *Hill Farm. R.O.*

reproduction

metabolism of phosphoglycerides in ram seminal fluid: *Babraham*

a study of fertility in sheep: *Cambridge Univ., School of Agriculture* (R.G.)

effect of thyroxine on fertility of sheep: *Compton*

Dentition and Skeletal Growth

see also Chemical Pathology, *page* 89

survey and classification of the dentition of sheep with reference to possible genetical and nutritional factors; mineral metabolism and its relation to skeletal growth and lactation in Blackface sheep: *Hill Farm. R.O.*

bone examination of experimental and hill sheep; dentition of sheep (radiology); histological and radiological studies of the dentition of sheep under field and laboratory conditions: *Rowett*

the growth and resorption of bones of sheep under field and laboratory conditions; effect of level of nutrition in early life on dental history of breeding ewes: *Rowett*

the vitamin D reserves of sheep; studies of the effect of diet during growth on the permanent dentition and supporting structures of sheep: *Rowett*

Diseases and Disorders

blowflies

see Arthropod Parasites, insects, *page* 79: *Weybridge*

copper deficiency

a study on the forms in which trace metals, especially copper, occur in biological materials: *Moredun*

investigations on pregnant ewes fed hay and oats with a low copper content: *Moredun*

grazing experiments with sheep on copper-deficient land in Aberdeenshire (in collaboration with *Macaulay*): *Moredun*

the state of combination of copper in pasture materials, etc: *Rowett*

the metabolism of naturally occurring copper complexes in the digestive tract of the sheep: *Rowett*

copper therapy by sequestration of copper and copper complexes in sheep: *Rowett*

copper-molybdenum-inorganic sulphate relationships: effect of molybdenum and inorganic sulphate and other factors in the diet on liver copper storage: *Weybridge*

enzootic abortion
see page 87: *Moredun*

foot and mouth
see page 88: *Pirbright*

foot rot
see page 81: *V.I. Centre*

hypomagnesaemia
measures aimed at preventing the disease in sheep and cattle: *N. Scot. Coll.*

see also Chemical Pathology, *page* 89: *N. Scot. Coll.*

Johne's disease
see also page 81

epidemiology and diagnosis of this disease in cattle and sheep: *E. Scot. Coll.*

liver fluke
survey of liver fluke snails and fluke egg counts in faecal samples: *Hill Farm. R.O.* (in collaboration with *Weybridge* and *W. Scot. Coll.*)

a study of the ecology of *Limnea truncatula* to find a method of collecting the snail from areas where water has dried up: *N. Scot. Coll.*

a study of the ecology of the fluke snail, its control and an endeavour to forecast approaching epidemics: *Weybridge*

louping-ill
see page 88: *Moredun*

mastitis
see page 82

***Nematodirus* infestation**
see parasitic gastro-enteritis, *below*

orf
see page 88: *Compton*

parasitic gastro-enteritis

repeatability of estimates of helminth infestation based on faecal egg count; relation of egg count to body weight: *Edinburgh Univ., Dept. of Animal Genetics* (B.G.)

investigation of the build-up of *Nematodirus* infestation on a 3-year ley: *Exptl. Husb. Farm, Trawscoed*

worm infestation and density of stocking by ewes and lambs in relation to production per acre: *Grassland R.S.*

the control of worm infestation in sheep by grazing management: *Grassland R.S.*

the influence of mixed grazing on the parasite burdens of sheep and cattle: *Grassland R.S.*

effect of level of worm infestation on the productivity of lambs at pasture: *Grassland R.S.*

helminth survey: worm egg counts of sheep: *Hill Farm. R.O.* (in collaboration with *Moredun*)

survey of helminth infestation in selected flocks; identification of infestation patterns in different environments: *Moredun*

control of worm infestation in sheep maintained under system of intensive rotational grazing: *N.A.A.S., Provincial Centres*

nutrition and helminth infestations in sheep: *Rowett*

Nematodirus infestation: treatment and prevention trials: *V.I. Centre*

pasteurellosis

experimental reproduction of pasteurella haemolytic infection in sheep; investigation into the effect of normal body secretions upon the organism: *Moredun*

the classification of the causal organisms: *E. Scot. Coll.*

scouring

see Toxic Substances, general, *page* 96: *Grassland R.S.*

scrapie

neurological studies: *Cambridge Univ., Dept. of Vet. Clinical Studies* (R.G.)

electron microscope studies of the causal agent: *Compton*

pathogenesis of the disease; histological studies: *Compton*

transmission experiments with goats: *Compton*

investigation of breed susceptibility and genetical and congenital aspects of the disease: *Compton*

characterization of the causal agent: its inactivation, culture, transmission by various routes, adaptation to different hosts, isolation from different breeds of sheep; electron microscope studies: *Moredun*

pathogenesis of the disease: histology of C.N.S.: *Moredun*

immunological aspects of the disease: *Moredun*

sheep ticks

see Arthropod Parasites, mites and ticks, *page* 80: *Hill Farm. R.O.*

swayback

see also copper deficiency, *above*

the possible relationship between vitamin A deficiency and swayback: *V.I. Centre*

a disease of sheep with ataxic and nervous symptoms due to a myelin deficiency and distinct from swayback: *Weybridge*

tick-borne fever

studies on the life-cycle of the virus in the sheep and the tick: *Moredun*

examination of the part played by maternally transmitted immunity to tick-borne fever: *Moredun*

tick pyaemia

the comparative susceptibility of tick-borne fever-infected and normal lambs to the intravenous inoculation of staphylococci: *Moredun*

immunization experiments against staphylococci and their products; preparation of vaccines; immunization of laboratory animals and sheep and examination of their sera: *Moredun*

worms

see parasitic gastro-enteritis, *above*

Feeding and Nutrition

general

see also Alimentary Physiology, *page* 63

mixed grazing of cattle and sheep *v.* single stocking: *Exptl. Husb. Farm*

nutrition of ewes rearing two crops of lambs per annum; effect on lamb growth of level of feeding of ewes over different periods before and after lambing: *Rowett*

feeding of grass and grazing

feeding of grass and grass products to sheep: *E. Scot. Coll.*

output of beef and mutton under normal grazing management: *Exptl. Husb. Farm.*

management of the sward for fat lamb production; relationship between pasture conditions and nutrition of the lamb: *Grassland R.S.*

grazing behaviour of hill sheep: *Hill Farm. R.O.*

feeding of other crops

the use of Brassica crops for feeding store wether lambs: conditions under which fodder roots may be safely fed to tegs: *Exptl. Husb. Farm, Rosemaund*

comparison of different root crops and methods of management for fattening lambs: *Rowett*

winter feeding

the effect of various methods of wintering Gimmer Hoggs on growth, vigour and future breeding qualities; use of foggage for wintering hill ewe lambs: *Exptl. Husb. Farm, Great House*

effects of levels of feeding and the value of winter grass in feeding ewes during the latter half of pregnancy: *Grassland R.S.*

nutrition of ewes in winter: *Hill Farm. R.O.*

Management

see also Feeding, *above*

limits to intensive stocking with sheep: *Exptl. Husb. Farm, Bridget's*

fattening ability of hill lambs, including carcass investigations: *Hill Farm. R.O.*

wintering of ewe hoggs: *Hill Farm. R.O.*

effect of afforestation on the sheep flock and its behaviour: *Hill Farm. R.O.*

the value of hormones for fattening lambs: *Rowett*

influence of intensity of sheep stocking of pastures: *W. Scot. Coll.*

lamb losses on hill land: *W. Scot. Coll.*

Physiology

see Animal Physiology, *page* 63

Wool

variation in growth and fleece character of lambs from Blackface ewes mated to various breeds of ram: *A.B.R.O.*

methods of fleece measurement: *A.B.R.O.*

the hair follicle group as the basis of fleece structure: *A.B.R.O.*

variation and development of medullation and shedding of fibres: *A.B.R.O.*

significance of type of birth coats in lambs: *A.B.R.O.*

the relationship between the birth coats of lambs and hardiness: *Exptl. Husb. Farm, Trawscoed*

studies on the weights and types of Blackface fleeces: *N. Scot. Coll.*

study of fleece characteristics of ewes and lambs on varying nutritional planes: study of wool growth and medullation under different nutritional and environmental conditions: *Rowett*

differential adsorption and persistence of BHC, DDT, dieldrin, and aldrin on sheep fleece: *Weybridge*

CROP INDEX

CROP INDEX

The crops which are the subject of current research are listed alphabetically.

A few researches using crops as experimental material occur only in the Subject Index, because the immediate object of enquiry is the elucidation of principles, the experimental material being of minor importance. Where the immediate object is improved production of a particular crop, the details will be found in the Crop Index. As a rule, breeding programmes, experiments on control of specific diseases, control of pests, cultural experiments, manurial experiments, and variety trials, are also entered in the Crop Index to avoid duplication of crop lists in the Subject Index.

ANEMONE

cultural methods, manuring, and disease control: *Exptl. Hort. Stn., Rosewarne*

virus diseases of anemones: *Pl. Path. Lab.*

APPLE

see also Top Fruit, *page* 181

Breeding and Genetics

breeding for frost resistance, late blossoming and high quality; effect of pollen variety upon fruit characters; breeding of an extended range of rootstocks for specific purposes: *E. Malling*

large-scale production of hybrids for selection of superior segregates; studies of the juvenile phase with the object of decreasing generation time; production of polyploids and artificial mutations: *John Innes*

species hybridization in *Malus*; pear-apple hybrids: *John Innes*

dessert apples—observations on early, mid-season and late seedling varieties; cider apples—observation on seedling varieties: *Long Ashton*

Cultural Systems

comparison of several planting systems (planted 1954): *Exptl. Hort. Stn., Luddington*

growth, flowering and cropping of trees grown under different systems: *Long Ashton*

cultural systems for cider apples: *Long Ashton*

stem builders and rootstocks for standard cider-apple trees: *N.A.A.S., West Midland Province*

other references: soil management in orchards, *page* 183

see under Top Fruit

Diseases and Disorders

apple canker—nutritional relations and protective spraying: *E. Malling*

collar-rot—aetiology, ecology of the fungus in soil, and control: *E. Malling*

mildew—control by fungicides: *E. Malling*

scab—collection of strains of *Venturia* spp.; studies in culture; variation in pathogenicity; causes of host resistance: *E. Malling*

storage rots—*see* Storage, *below*: *E. Malling*

virus diseases—incidence and symptoms; varietal susceptibility (stock and scion); histology of rubbery wood: *E. Malling*

brown rot—factors influencing infection; biology of the fungi; trials of fungicides for control: *Long Ashton*

canker—parasitism of *Nectria galligena*; varietal and seasonal resistance of leaf scars; trials of fungicides for control: *Long Ashton*

mildew—development of *Podosphaera leucotricha* in buds; trials of fungicides: *Long Ashton*

scab—trials of new fungicides for control: *Long Ashton*

viruses in relation to fruit tree propagation—*see* Rootstocks, *below*: *Long Ashton*

canker—control by new fungicidal methods: *N.A.A.S., South Western Province*

scab, canker, and mildew—epidemiology and control; fruit rots—investigation and control: *N. Ireland*

scab forecasting and infection studies: *Pl. Path. Lab. and N.A.A.S.*

Frost Damage

see Top Fruit

Nutrition

mineral nutrition—uptake, distribution and utilization of mineral elements in relation to growth and cropping; effects of varying iron and magnesium supply in spray culture; field investigations of manurial requirements under various soil management systems: *E. Malling*

long-term fertilizer experiment (started 1955): *Exptl. Hort. Stn., Efford*, (in collaboration with *Long Ashton*)

effect of cover crops and fertilizers on tree growth, yield, and leaf nutrient status; long-term experiments at *Long Ashton* and at *Efford Exptl. Hort. Stn.*: (in collaboration with *N.A.A.S.*)

effect of spraying with urea to correct nitrogen deficiency: *N.A.A.S., Yorks. and Lancs. Province*

Pests

codling moth—life cycle; field trials of control measures, parasites: *E. Malling*

red spider mite—effect of various sprays on populations of the mite and its predators: *E. Malling*

winter moth—control by spring washes: *E. Malling*

woolly aphid—tests of apple seedlings for resistance: *E. Malling*

efficiency of spring washes against pests occurring during the pre-blossom period: *E. Malling*

varietal susceptibility to aphids, sucker, caterpillar and sawfly: *Long Ashton*

control of red spider mite; effects of insecticide and fungicide programmes on beneficial predators: *N. Ireland*

control of aphids, apple sucker, winter moths and Tortricid moths with winter ovicides and new insecticides: *N. Ireland*

Physiology

analysis of fruiting—fruit-bud induction; morphology and development of fruit buds; pollination and set; fruit retention and growth: *E. Malling*

control of biennial bearing—effects of variety, rootstock, and season; leaf, shoot and bud development in 'on' and 'off' years; methods for preventing excessive blossoming; methods of blossom and fruit thinning: *E. Malling*

fruit drop—physiology of the abscission process: *E. Malling*

growth—analytical description of growth; developmental studies; growth-regulating substances; physiology of regeneration by cuttings: *E. Malling*

metabolites of the apple tree—chemical studies of the more important carbohydrates, protein sources and other metabolites: *E. Malling*

physical structure of the cell wall and protoplast of the apple fruit in relation to stage of development and changes during senescence; effects of virus infection on fine structure of cell walls in the wood: *Leeds Univ., Dept. of Botany* (R.G.) (in collaboration with *E. Malling*)

growth-regulating substances in relation to fruit set, development, and fruit drop; trials of chemical thinning agents: *Long Ashton*

physiological studies on the dormancy and cold requirements of apple seeds: *Long Ashton*

Pruning and Training

pruning in relation to early maturity and to biennial bearing; summer pruning of dwarf trees; pruning for even blossom production: *E. Malling*

physiological basis of response to stem pruning: *E. Malling*

Rootstocks

rootstock/scion relations; testing of new rootstocks for improved range of vigour and precocity and other special purposes: *E. Malling*

distribution of latent viruses in commercial rootstocks; selection and maintenance of virus-free clones: *E. Malling*

comparison of newer rootstocks with the original Malling series (planted 1953): *Exptl. Hort. Stn., Luddington*

value of apomictic seedlings of *Malus* spp. as rootstocks for apples; occurrence and mechanism of apomixis in *Malus*; transmission of apple viruses through apomictic seeds: *Long Ashton*

investigation of certain graft incompatibilities: *Long Ashton*

effect of latent virus infection on the productivity of rootstock stoolbeds: *Long Ashton*

tests of Malling/Merton rootstocks: *N.A.A.S., Eastern, South Western and West Midland Provinces*

Spray Programme

effects of various spray programmes upon predatory insects and mites and upon degree of control of pests and diseases: *E. Malling*

comparison of winter spraying of DNOC with spring spraying of BHC/DDT; comparison of three summer spray programmes: *Exptl. Hort. Stn., Luddington*

Storage

orchard factors affecting storage life of apples (in collaboration with *Ditton Laboratory, D.S.I.R.*); control of *Gloeosporium* rots by orchard spraying: *E. Malling*

perennation of fruit-rotting fungi on the tree; effects of environmental factors on susceptibility of branches and fruit to attack; trials of late summer sprays against storage rot fungi: *Long Ashton*

Varietal Studies

dessert varieties: studies of important new varieties: *E. Malling*

comparison of dessert and culinary varieties under different systems of training (planted 1952): *Exptl. Hort. Stn., Stockbridge House*

cider apples—observations on seedling varieties and selection of parents for breeding; pollination requirements of cider varieties: *Long Ashton*

dessert varieties—observations on seedling varieties: *Long Ashton*

behaviour and performance of cider-apple varieties grown as bush and as standard trees: *N.A.A.S., South Western Province* (in collaboration with *Long Ashton*)

maintenance of variety collection; trials of new varieties against standard varieties of the same group, at headquarters and at *Exptl. Hort. Stns.*: *Nat. Fruit Trials*

variety and rootstock trials (planted 1954) to assess the merits of varieties and rootstocks in Scotland: *Scot. Hort. R.I.*

ASPARAGUS

spacing and variety studies: *Exptl. Hort. Stn., Luddington*

breeding for all-male populations and for hybrid vigour: *N.V.R.S.*

BARLEY

see also Cereals

Breeding and Genetics

winter barley—breeding of two-row types to combine improved malting quality, stronger straw, high yield and winter hardiness; study of the possibility of breeding alternative spring/winter types; breeding of six-row feeding barley with short straw and high yield; breeding of mildew-resistant types, and study of the inheritance of resistance: *Pl. Br. Inst.*

spring barley—breeding of two-row malting types to combine high yield, stronger straw, and resistance to mildew and loose smut, with good malting quality; breeding of strong-strawed two-row types for feeding purposes; study of useful mutants produced from irradiated grain; development of laboratory tests for estimation of malting quality during the early stages of selection in hybrid material; study of diallel crosses between established varieties, and the use of F_1 analysis in predicting cross performance: *Pl. Br. Inst.*

cytogenetical studies of *Hordeum*; species relationships and induction of mutations: *Univ. Coll. Wales, Dept. of Agric. Botany* (R.G.)

breeding of spring feeding barley suitable for high rainfall areas: *Welsh P.B.S.*

Diseases

control of loose smut: *E. Scot. Coll.*

undersowing with trefoil as a means of reducing Take-all: *N.A.A.S., South Western Province*

loose smut—technique for testing varietal susceptibility: *N.I.A.B.*

mildew—inheritance of resistance in barley hybrids: *Pl. Br. Inst.*

Husbandry

experiment (laid down 1954) to determine the effects of growing barley continuously with and without undersowing: *Exptl. Husb. Farm, High Mowthorpe*

effect of seed rate and level of nitrogen on yield and quality of malting and feeding barley: *Exptl. Husb. Farm, Bridget's*

seed rates and other husbandry factors: *N.A.A.S., Provincial Centres*

interactions of varieties and manurial levels in the production of feeding barley: *N. Ireland*

effects of varying seed rate and fertilizers on the yield, size of grain and amount of lodging in barley: *Rothamsted*

Irrigation

effects of overhead irrigation on farm crops, including barley in rotation (at *Woburn*): *Rothamsted*

Manuring

levels and times of application of nitrogen; use of agricultural salt; trials with trace elements: *N.A.A.S., Provincial Centres*

various long-term experiments with barley in rotations: *Rothamsted*

Variety Trials

identification of varieties by morphological characters; field trials (*see* Cereals, *page* 150): *N.I.A.B.*

field trials of local and introduced varieties: *N. Ireland*

BEANS (Phaseolus)

variety trials and short-term cultural experiments with French beans: *Exptl. Hort. Stns.*

varietal identification and classification: *N.I.A.B.*

Fusarium wilts of beans: *N.V.R.S.*

variety trials and breeding to develop varieties of French beans for Scottish conditions and market requirements: *Scot. Hort. R.I.*

BEANS (Vicia) (FIELD BEANS)

Breeding and Genetics

strain studies with particular reference to selection and testing; collection and evaluation of British and foreign strains: *N.I.A.B.*

improvement of winter beans by hybridization and selection for yield, winter-hardiness, and disease resistance: *Pl. Br. Inst.*

improvement of spring beans by hybridization and selection for yield and black fly resistance: *Pl. Br. Inst.*

developmental physiology, with special reference to winter-hardiness: *Pl. Br. Inst.*

floral biology and inbreeding, with reference to the feasibility of exploiting heterosis: *Pl. Br. Inst.*

cytogenetical studies of *Vicia*; production of new polyploids and studies of combining abilities of species: *Univ. Coll. Wales, Dept. of Agric. Botany* (R.G.)

study of the breeding system; selection of early ripening, high yielding types; search for resistance to chocolate spot and *Ascochyta*: *Welsh P.B.S.*

Husbandry

influence of various husbandry factors on the growth of spring beans: *Exptl. Husb. Farm, Boxworth*

effect of row width on winter beans: *Exptl. Husb. Farm, Rosemaund*

seed rate, row width and method of sowing: *N.A.A.S., Provincial Centres*

effects of seed rate, time of sowing, seed size, seed dressing and crop mixtures; direct comparison of spring and winter beans: *N.I.A.B.*

effects of various fertilizer treatments, cultural treatments, and sprays: *Rothamsted*

Pests

effect of insecticides on the black bean aphis and on the general population ecology in the bean field: *Rothamsted*

Variety Trials

trials at Regional Trial Centres and also in collaboration with *N.A.A.S.* at *Exptl. Husb. Farms and Provincial Centres*: *N.I.A.B.*

BEET (FODDER)

Manuring

field trials of manganese sprays on deficient crops: *N.A.A.S., South Western Province*

quantity and time of application of nitrogen, combined with spacing experiments: *N. Scot. Coll.*

Variety Trials

yield trials and observation plots at Regional Trial Centres and in collaboration with *N.A.A.S.* at *Exptl. Husb. Farms and Provincial Centres*: *N.I.A.B.*

BEET (RED)

Breeding

selection and breeding for colour, uniformity and reduced bolting: *N.V.R.S.*

Diseases

silvering disease—studies of the bacterial pathogen, field spread, mode of transmission and control: *N.V.R.S.*

Nutrition

effect of agricultural salt: *N.A.A.S., South Eastern Province*

Physiology
causes of poor germination in certain strains: *N.V.R.S.*

Variety Studies
identification and classification of strains: *N.I.A.B.*

Weed Control
Exptl. Hort. Stn., Efford (in collaboration with *N.V.R.S.*)

BEET (SUGAR)

see Sugar Beet

BLACKBERRY

(and other *Rubus* berries, excepting raspberry)

Breeding and Genetics
selection of thornless and apomictic forms; blackberry-raspberry hybrids; species relationships in *Rubus*: *John Innes*

Varietal Studies
isolation and testing of desirable clones: *E. Malling*

BLACK CURRANT

Breeding and Genetics
selection of new seedlings; production and study of polyploids and interspecific crosses: *E. Malling*

selection of late ripening seedlings with high vitamin C content; survey of *Ribes* species as potential breeding material; induction of polyploidy, and of mutations: *Long Ashton*

cytogenetical studies in *Ribes*; crossability of species: *Manchester Univ., Dept. of Botany* (R.G.)

Cultural Methods
effects of soil moisture level on growth and cropping: *E. Malling*

control of pre-harvest drop with NAA: *Long Ashton*

effects of mulches on soil moisture; trials with herbicides: *Long Ashton*

Diseases
development of apothecia of *Pseudopeziza ribis* on fallen leaves; method of field assessment of leaf-spot; trials of fungicides against leaf-spot: *Long Ashton*

effects of organic fungicide residues on processing qualities of the fruit: *Long Ashton*

virus diseases—vector relations and epidemiology of reversion and other viruses of *Ribes*: *Scottish Hort. R.I.*

Nutrition

long-term manurial experiments in collaboration with *Long Ashton*: *Exptl. Hort. Stns., Efford, Luddington*

relations between growth, yield and leaf nutrient status—long-term manurial experiments at *Long Ashton* and at *Exptl. Hort. Stns.* in collaboration with *N.A.A.S.*: *Long Ashton*

manurial experiments to find most suitable treatment for maximum yield: *N.A.A.S., East Midland and South Eastern Provinces*

Pests

gall mite—use of sprays in control: *E. Malling*

spraying for control of midge: *E. Scot. Coll.*

control of red spider and big bud mite: *Exptl. Hort. Stn., Luddington*

control of midge by dieldrin sprays: *N.A.A.S., South Eastern Province*

control of Currant Clearwing moth: *N.A.A.S., East Midland Province*

Variety Trials

records of flowering dates and cropping: *Long Ashton*

tests of new varieties against standard varieties of the same group: *Nat. Fruit Trials*, at headquarters and at *Exptl. Hort. Stns.*; *Scot. Nat. Fruit Trials*, conducted co-operatively by *Scot. Hort. R.I., E. Scot. Coll., N. Scot. Coll. and W. Scot. Coll.*

BLUEBERRY

exploratory trials: *Long Ashton*

variety and manurial trial: *N. Scot. Coll.*

BRASSICAE

see also Broccoli, Brussels sprouts, Cabbage, Cauliflower, Kale, Rape, Swede, Turnip

Breeding and Genetics

breeding methods—effects of inbreeding and subsequent combination of inbred lines; effect of different levels of selection on variation in subsequent generations; causes of deterioration of varieties following natural crossing: *N.V.R.S.*

relations between climate, genetical constitution, and the production of aberrant types: *Scot. Hort. R.I.*

breeding and selection of winter-hardy Brassicae for Scottish conditions: *Scot. Hort. R.I.*

see under Kale: *Pl. Br. Inst., Scot. P.B.S., Welsh P.B.S.*

Diseases

clubroot

effect of rotations and chemical treatments; spore viability: *E. Scot. Coll.*

varietal susceptibility: *N.I.A.B.*

epidemiology and control by soil disinfection; varietal susceptibility; soil testing for presence of causal organism: *N. Ireland*

effects of chlorinated hydrocarbons on disease incidence: *N.V.R.S.*

tests of reputedly resistant varieties: *N. Scot. Coll.*

life history of *Plasmodiophora brassicae* and factors affecting spore germination; influence of the rhizosphere on the germination of resting spores: *Rothamsted*

miscellaneous

Verticillium wilt of Brussels sprouts: *Swansea Univ. Coll., Dept. of Botany* (R.G.)

virus diseases

use of barrier crops to protect broccoli seed beds from vectors of mosaic: *Exptl. Hort. Stn., Luddington* (in collaboration with *Rothamsted*)

varietal resistance in Brussels sprouts to ringspot virus; collection of resistant varieties at *Rosewarne*: *N.A.A.S.*

spread of cauliflower mosaic in the field: *N.A.A.S. and Pl. Path. Lab.*

varietal susceptibility and tolerance in hardy broccoli: *N.I.A.B.*

the transmission of various viruses of cruciferous crops by flea-beetles: *Rothamsted*

field experiments on the spread and control of cauliflower mosaic and cabbage ringspot viruses: *Rothamsted* (in collaboration with *N.I.A.B. and N.A.A.S.*)

Oil Production

see Rape

Pests

bionomics of *Meligethes* spp. (pests of brassica seed crops): *E. Scot. Coll.*

cabbage root fly—comparison of insecticides for control: *Exptl. Hort. Stns., Luddington, Stockbridge House* (in collaboration with *N.V.R.S.*)

cabbage root fly—control: *N.A.A.S., Advisory Entomologists*

cabbage root fly—field use of insecticides for control; methods of application, rate of deterioration in soil, phytocidal effects, crop contamination; relative importance of various natural enemies of the cabbage root fly and the effects of insecticidal treatment on them; crop damage at different levels of infestation: *N.V.R.S.*

cabbage root fly—control with chlorinated hydrocarbon insecticides: *N. Ireland*

factors influencing the maintenance of a laboratory culture of cabbage white butterfly (*Pieris brassicae*): *Unit Insect Phys.*

Physiology
factors influencing heading or bolting in selected *Brassica* species and varieties: *Scot. Hort. R.I.*

Seed Production
control of *Botrytis* disease in glasshouse production of nucleus stock seed: *N.V.R.S.*

use of honeybees and bumblebees as pollinators of brassica seed crops: *Rothamsted* (in collaboration with *N.V.R.S.*)

Variety Trials
N.I.A.B. (in collaboration with *Exptl. Hort. Stns.* and *N.V.R.S.*)

BROCCOLI (HEADING)

see under Cauliflower

BROCCOLI (SPROUTING)

calabrese types—trial of varieties for quick freezing: *N.V.R.S.*

BRUSSELS SPROUTS

see also Brassicae

Breeding and Genetics
selection, trials and propagation of promising new varieties; reselection and maintenance of nucleus stock seed of varieties already distributed: *N.V.R.S.*

breeding of strains to suit Scottish conditions: *Scot. Hort. R.I.*

Diseases
see under Brassicae

Manuring
factorial manurial experiment: *N.A.A.S., Northern Province*

Pests
see under Brassicae

Variety Trials
trials at Regional Trial Centres: *N.I.A.B.* (and in collaboration with *N.A.A.S.* at *Exptl. Hort. Stns.* and *Provincial Centres*)

BULBS

cultural and nutritional experiments with bulbs; control of pests, diseases and weeds in bulb crops: *Exptl. Hort. Stn., Rosewarne*

growing of bulbs in mobile glasshouse: *Exptl. Hort. Stn., Stockbridge House*

long-term nutrition experiment with narcissus and tulip bulbs; short-term experiments on planting, spacing, weed control, and cultivation; control of tulip 'fire': *Exptl. Husb. Farm*

nutritional requirements of narcissus: *N.A.A.S., South Western Province*

mechanical planting and harvesting of bulbs: *N.I.A.E.*

CABBAGE

see also Brassicae

Breeding

breeding of improved spring cabbage of two types—for greens and for hearting; selection, trials and propagation of promising new varieties: *N.V.R.S.*

breeding of winter-heading cabbage for Scotland; search for strains with high dry-matter content and suitable for drying: *Scot. Hort. R.I.*

Cultural Methods

spacing trials: *Exptl. Hort. Stn., Rosewarne*

spacing trials of winter cabbages: *N.I.A.B.*, at Regional Trial Centres and in collaboration with *Exptl. Hort. Stns.*

Diseases

see under Brassicae

Pests

see under Brassicae

Variety Trials

trials at *N.I.A.B.* Regional Trial Centres and in collaboration with *Exptl. Hort. Stns.*

CARNATION

bacterial diseases of carnations: *Pl. Path. Lab.*

developmental physiology of carnations: *Reading Univ., Dept. of Horticulture* (R.G.)

CARROT

Pests

carrot fly—comparison of insecticides for control: *N.A.A.S., Provincial Centres*

carrot fly—control by soil insecticides: *N.V.R.S.*

control of carrot fly with chlorinated hydrocarbon insecticides: *N. Ireland*

Variety Trials

preliminary investigation into varietal characters: *N.I.A.B.* (in collaboration with *Exptl. Hort. Stns.*)

CAULIFLOWER (AND BROCCOLI)

see also Brassicae

Breeding

Seale Hayne strains of winter cauliflower: *N.I.A.B.*

selection and trial (in collaboration with *N.I.A.B.* and *Exptl. Hort. Stns.*) of new varieties of winter and summer types; reselection and maintenance of nuclear stock seed of distributed varieties: *N.V.R.S.*

Cultural Methods

study of cultural methods in relation to 'blindness' in early cauliflower: *Exptl. Husb. Farm, Kirton*

planting date and spacing for winter cauliflower: *N.A.A.S., Wales*

Diseases

see under Brassicae

Pests

see under Brassicae

Physiology and Nutrition

factors affecting time of heading and quality of curd in winter cauliflower: *N.I.A.B.*

role of molybdenum in the growth of cauliflower, with special reference to the development of 'whiptail' leaves: *Unit Pl. Nutr.*

Seed Production

plant spacing and manuring in relation to yield of seed: *N.I.A.B.*

Variety Trials

trials at *N.I.A.B.* Regional Trial Centres and in collaboration with *Exptl. Hort. Stns.* and *Kirton*

CELERY

Cultural Methods

cultural experiments with self-blanching celery: *Exptl. Hort. Stns., Efford, Luddington, Stockbridge House*

Nutrition

responses to potash and salt on fen soils: *N.A.A.S., Eastern Province*

Pests

control of leaf miner: *N.A.A.S., East Midland Province*

CEREALS

see also Barley, Maize, Oats, Wheat

Breeding and Genetics

artificial induction of mutations in cereals by irradiation of seeds, with the object of producing improved agricultural characters: *Pl. Br. Inst.*

breeding programmes, *see* Barley, Oats, and Wheat: *Pl. Br. Inst.*

Diseases

identification of, and varietal susceptibility to, races of yellow rust and loose smut; varietal susceptibility to other diseases; technique of large-scale hot-water treatment of seed against smut diseases: *N.I.A.B.*

smut diseases of cereals in the north of Scotland; analysis of races of smuts occurring; tests of breeding material for resistance: *N. Scot. Coll.*

mildew and yellow rust surveying: *Pl. Path. Lab. and N.A.A.S.*

seed-borne diseases; health of seed stocks; efficacy of seed treatment: *Pl. Reg. Stn., D.A.S. Plant Path. Service*

foot rots—field experiments to find the precise conditions that affect the spread of pathogens: *Rothamsted*

mildews—measurement of losses caused by cereal mildew; control by fungicides: *Rothamsted*

virus diseases—identification and studies of transmission of cereal viruses: *Rothamsted*

Harvesting

examination of causes of grain damage in relation to quality and keeping qualities of wheat and barley: *N.I.A.E.*

technique of testing harvesting machinery: *N.I.A.E.*

combine harvesting on sloping ground: *N.I.A.E.* (*Scot.*)

harvesting methods in high rainfall districts: *W. Scot. Coll.*

Husbandry

various experiments comparing seed rates, sowing times, levels and times of application of nitrogen, and other husbandry factors: *Exptl. Husb. Farms, Boxworth, Bridget's, High Mowthorpe, Rosemaund, Terrington*

various experiments on seed rates, date of sowing, and other husbandry factors: *N.A.A.S., Provincial Centres*

various husbandry experiments: *Norfolk*

other references: Crop Husbandry *in* Subject Index, *page* 13

Nutrition

performance of different varieties at various levels of manuring: *Exptl. Husb. Farms*

times and levels of nitrogenous top dressings; various other manurial experiments; trials with trace elements: *N.A.A.S., Provincial Centres*

field experiments on time of application of nitrogen to spring cereals: *Rothamsted*

Pests

bionomics of the cereal root eelworm: *E. Scot. Coll.*

ecology of frit fly and related dipterous stem borers in cereals and wild grasses: *London Univ., Imperial College, Dept. of Zoology and Applied Entomology* (R.G.)

control of stem and root eelworms and other pests of cereals: *N.A.A.S., Advisory Entomologists*

distribution and economic importance of cereal root eelworm in north-east Scotland: *N. Scot. Coll.*

eelworms—population changes in *Heterodera major* due to growing different cereals (field plot experiment in association with N.A.A.S.); studies of susceptibility of cereals to *H. major*: *Rothamsted* (in collaboration with *N.I.A.B.* and *N.A.A.S.*)

gall midges: *Rothamsted*

Storage of Grain

grain drying plant; physical and mechanical properties of grain relevant to conservation; outdoor storage plant: *N.I.A.E.*

Variety Trials

identification and description of cereal varieties by field characters and morphology: *N.I.A.B.*

varietal differences in growth of cereal seedlings in conditions of controlled day length after vernalization, as aid to identification: *N.I.A.B.*

trials at 13 Regional Trial Centres and also in collaboration with *N.A.A.S.* at *Exptl. Husb. Farms* and other centres; assessment of yield, field characters, reaction to nitrogen, resistance to diseases and pests; also assessment of the quality of the produce, in collaboration with users' organizations: *N.I.A.B.*

comparison of new and established varieties of oats, barley and wheat: *N. Scot. Coll.*

botanical studies for diagnosis of varieties: *Pl. Reg. Stn.*

variety trials of oats: *W. Scot. Coll.*

Weed Control

survival of wild oat seeds under a long ley: *Exptl. Husb. Farm, Boxworth*

long-term effects of repeated applications of chemical weedkillers (started 1951): *Exptl. Husb. Farm, Bridget's*

various field experiments: *N.A.A.S., Provincial Centres* (in collaboration with *Unit Exptl. Agron.*)

practical trials of selective weedkillers: *N. Ireland*

use of selective weedkillers on undersown cereal crops: *N. Scot. Coll.*

effects of new and established herbicides on cereal crops and their weeds; field experiments: *Unit Exptl. Agron.* (in collaboration with *N.A.A.S.*)

CHERRY

bacterial canker—studies of pathogen, aetiology and control: *E. Malling*

pruning trials; rootstock/scion relations; testing of new rootstock clones; varietal studies: *E. Malling*

breeding of self-fertile cherries: *John Innes*

comparison of organic manures and mineral fertilizers: *N.A.A.S., South Eastern Province*

CHRYSANTHEMUM

Cultural Methods

various short-term experiments in propagation and culture: *Exptl. Hort. Stns., Fairfield, Luddington, Stockbridge House*

Diseases

studies of the flower-distorting virus: *Glasshouse Crops*

virus diseases; aspermy propagation of healthy stocks: *N. Ireland*

virus diseases—analysis of virus complexes; production of virus-free stocks: *Pl. Path. Lab.*

Pests

use of parathion for control of eelworm: *E. Scot. Coll.*

bionomics, morphology and control of *Psila* spp. which mine the stools and shoots: *E. Scot. Coll.*

control of eelworm by stool treatment: *N.A.A.S., West Midland Province*

Variety Trials

trials of early flowering varieties: *N. Scot. Coll.*

trials of early flowering varieties: *W. Scot. Coll.*

CLOVER

Breeding and Genetics

selection by seedling infection tests of forms resistant to *Sclerotinia trifoliorum*; progeny testing and inbreeding; development of field tests for resistance: *Pl. Br. Inst.*

breeding of red and white clovers; potentiality trials of foreign and native strains; breeding technique; heterosis; genetical studies: *Welsh P.B.S.*

selection and testing for resistance to *Sclerotinia trifoliorum*: *Welsh P.B.S.*

selection and breeding of red clover for resistance to eelworm (*Ditylenchus dipsaci*): *Welsh P.B.S.*

polyploidy in red and white clovers; interspecific hybridization in *Trifolium*: *Welsh P.B.S.*

breeding of white clover strains containing cyanogenetic glucoside and enzyme, enzyme only, glucoside only, or free of both glucoside and enzyme, with a view to testing their bloat-producing properties: *Welsh P.B.S.*

pollination techniques—use of bees for pollination in small cages: *Welsh P.B.S.*

Ecology

mineral nutrition of certain races of wild white clover: *Univ. Coll. N. Wales, Dept. of Agric. Botany* (R.G.)

Manuring

effect of manuring broad red clover: *N.A.A.S., Eastern Province*

interaction of nitrogen, potash and phosphate on establishment and vigour of white clover: *N. Ireland*

effects of seasonal variations in weather on response to varying quantities of fertilizers (long-term rotation experiment including clover): *Rothamsted*

Nodule Bacteria

relative efficiency of *Rhizobium* strains in clovers: *E. Scot. Coll.*

influence of environmental factors on the nodulation of legumes: *Grassland R.S.*

comparison of yields from inoculated and uninoculated seed: *N.A.A.S., Northern Province*

microbiological studies of *Rhizobium* (*see details under* Microbiology *in* Subject Index, *page* 24): *Rothamsted*

role of micro-nutrients in nodulation of clover: *Unit Pl. Nutr.*

study of the nodule organism in relation to inducing nodule formation in *Trifolium ambiguum*: *Welsh P.B.S.*

Pests

pest damage assessment in red clover: *Grassland R.S.*

effect of clover seed weevils (*Apion* spp.) and other insects on clover seed production: *Pl. Path. Lab. and N.A.A.S.*

clover flower midges: *Rothamsted*

Seed Production

effect of phosphate and potash on yield of red clover seed: *N.A.A.S., Wales*

defoliation to facilitate harvesting: *N.A.A.S., Provincial Centres* (in collaboration with *Unit Exptl. Agron.*)

survey of red clover seed crops; pollination, nutrition, and other factors likely to affect yield and quality of seed: *N.I.A.B.*

pollination studies of red clover, particularly in relation to nectar yield of individual plants: *Rothamsted*

evaluation of desiccants and defoliants to facilitate harvesting: *Unit Exptl. Agron.* (in collaboration with *N.A.A.S.* and *N.I.A.B.*)

effects of soil fertility and husbandry factors: *Welsh P.B.S.*

Variety Studies

classification and identification of indigenous and foreign strains of red clover and white clover; strain trials of red clover: *N.I.A.B.*

comparative study of selected varieties under lowland and upland conditions: *Welsh P.B.S.*

Weeds

effects of selective herbicides on clovers: *Unit Exptl. Agron.*

spread and control of broomrape in field experiments with clover: *Welsh P.B.S.*

COCKSFOOT

see under Grasses

COMFREY

nutritive value of Russian comfrey: *E. Scot. Coll.*

variety trial: *Exptl. Husb. Farm, Bridget's*

variety trials of Russian comfrey: *N.I.A.B.*

CUCUMBER

trials of new fungicides against cucumber mildew: *Glasshouse Crops*

FLAX

breeding for resistance to *Polyspora lini*, *Melampsora lini*, and *Phoma* spp.; also for stiffness of straw, high percentage of fibre, seed yield, and fibre quality: *N. Ireland*

field trials of local and foreign varieties: *N. Ireland*

diseases of fibre flax; seed health survey; varietal susceptibility; testing for disease resistance; crop nutrition and incidence of disease; control of seed-borne diseases by seed disinfectant: *N. Ireland*

FLOWERS

see separate headings for Anemone, Bulbs, Carnation, Chrysanthemum, Roses

variety trials, propagation, nutrition and pathology of various species of flowers grown in the open: *Exptl. Hort. Stns.*

visual symptoms of mineral deficiency in hydrangeas: *Glasshouse Crops*

virus diseases of dahlia: *W. Scot. Coll.*

FRUIT

see Soft Fruit *and* Top Fruit, *also the various fruit species*

GLASSHOUSE CROPS

see also Carnation, Chrysanthemum, Cucumber, Roses, Tomato

Cultural Methods

supplementary light irradiation of glasshouse crops: *E.R.A.*

watering—tests of trickle irrigation system; calculation of water requirement: *Exptl. Hort. Stn., Fairfield* (in collaboration with *N.I.A.E.*)

soil treatments and propagation methods: *Glasshouse Crops*

raising of plants: development of loam for composts: physical properties and nutrient status of composts: *John Innes*

use of artificial as supplement to natural light: *John Innes*

investigation of glasshouse watering systems; distribution of water in soil from trickle nozzles: *N.I.A.E.* (in collaboration with *Fairfield*)

water relations of plants growing under glass, with special reference to the tomato: *Nottingham Univ., Dept. of Horticulture* (R.G.)

Dutch Lights and Frames

trials of crop varieties suitable for protected cropping; cultural methods; nutrition; soil warming; weed control: *Exptl. Hort. Stns., Efford, Luddington, Rosewarne, Stockbridge House*

Experimentation

uniformity trials; effect of position of experimental plots in a glasshouse: *Exptl. Hort. Stn., Fairfield*

design of glasshouse experiments: *John Innes*

Glasshouse Climate

see under Meteorology, *page* 12

Glasshouse Design and Construction

trials of advances in design and construction of commercial glasshouses—methods of timber preservation; hardwood timbers as substitutes for

softwoods; comparison of different softwoods, with and without preservative treatments: *Exptl. Hort. Stn., Fairfield*

orientation and roof shape in propagating houses: *Exptl. Hort. Stns., Efford, Fairfield, Stockbridge House*

Glasshouse Heating and Ventilation
see Glasshouse Heating *under* Agricultural Engineering, *page* 102

Glasshouse Soils
conditioning of glasshouse soil: *Exptl. Hort. Stns., Efford, Fairfield*

steam sterilization; effect of partial sterilization on plant nutrients; causes of injury to plants in sterilized soil; effects of continuous cropping on glasshouse soils: *Glasshouse Crops*

Mobile Glasshouses
study of suitable cropping sequences for heated and unheated mobile glasshouses: *Exptl. Hort. Stns., Stockbridge House*

comparison of different cropping sequences under mobile structure: *Exptl. Hort. Stn., Efford, Rosewarne*

Pest Control
application of pest control chemicals in glasshouses, especially aerosol, smoke, and low-volume spraying methods: *Glasshouse Crops*

GOOSEBERRY

Breeding and Genetics
breeding for thornlessness, using interspecific crosses: *E. Malling*

collection of varieties and of *Ribes* species; inheritance studies; interspecific crosses: *Manchester Univ., Dept. of Botany* (R.G.)

Diseases
spraying trial against mildew: *Exptl. Hort. Stn., Luddington*

trials of fungicides against gooseberry mildew: *Long Ashton*

effects of organic fungicide residues on processing qualities of the fruit: *Long Ashton*

heat therapy as a possible means of obtaining virus-free material: *Long Ashton*

Propagation
factors influencing the rooting of cuttings: *Long Ashton*

Varietal Studies
classification of varieties: *Long Ashton*

tests of new varieties against standard varieties of the same group: *Nat. Fruit Trials*, at headquarters and at *Exptl. Hort. Stns.*

collection and description of varieties: *N. Scot. Coll.*

GRASSES

see also Grassland *in* Subject Index, *page* 42

Breeding and Genetics

breeding of perennial ryegrass: *N. Ireland*

study of strain and species variability, ecological adaptation, physiological development, and disease resistance in the field; single plant selection and clonal multiplication of promising types: *Pl. Br. Inst.*

breeding of herbage grasses, with special attention to the needs of intensive systems of grassland farming: *Scot. P.B.S.*

re-examination of breeding techniques; observations on the combining abilities of commercial strains: *Scot. P.B.S.*

study of populations of various indigenous and introduced species with a view to finding parents for special-purpose strains: *Welsh P.B.S.*

genetical studies of seedling and other characters; inter-specific and inter-generic relationships in *Lolium*, *Festuca*, *Dactylis*, *Holcus*, *Phalaris*, *Molinia* and *Alopecurus*: *Welsh P.B.S.*

genetics of mutants in *Lolium perenne*: *Welsh P.B.S.*

progenies from crosses between *Lolium perenne* and *L. italicum*: *Welsh P.B.S.*

heterosis—the effect of varying the number of parental plants in a strain on the vigour of subsequent generations: *Welsh P.B.S.*

techniques for measuring variation in populations of herbage grasses; comparison of methods of progeny testing; assessment of potential variation within populations and its rate of release as affected by breeding system, population size, and intensity of selection: *Welsh P.B.S.*

cytological survey of *Dactylis*; production of autotetraploids and amphi-diploids; effects of seed ageing on chromosome breakage in strains of *Dactylis*; cytological studies in *Holcus* and *Anthoxanthum*: *Welsh P.B.S.*

Diseases

incidence and effects of *Helminthosporium* on timothy: *N.I.A.B.*

blind seed disease of ryegrass; seed health survey; control by use of resistant varieties: *N. Ireland*

fungi associated with *Lolium* species; studies of alkaloids in the host: *N. Scot. Coll.*

Ecology

genetical-ecological studies of hill and moorland species, with special reference to racial ecological preferences in *Festuca*; mechanisms of natural selection and the resulting patterns of hereditary variation: *Scot. P.B.S.*

genetical-ecological studies of *Anthoxanthum odoratum, Phalaris arundinacea* and *Molinia caerula*: *Welsh P.B.S.*

other references: Ecology *under* Grassland *in* Subject Index, *page* 44

Identification

classification and identification of indigenous and foreign strains of grasses: *N.I.A.B.*

botanical studies for identification and registration of strains: *Pl. Reg. Stn.*

Pests

gall midges of grasses: *Rothamsted*

control of timothy fly: *W. Scot. Coll.*

Physiology

absorption and utilization of major nutrient elements by timothy; formation and distribution of carbohydrates in relation to mineral nutrition: *Grassland R.S.*

absorption of nutrients applied as foliage spray: *Grassland R.S.*

growth analysis of timothy and meadow fescue; development of technique of leaf-area measurement; tiller production; effects of cutting on tillering and flowering: *Grassland R.S.*

effects of weather and location on seasonal variation in dates of emergence of inflorescences of *Lolium* spp. and other grasses; effect of selection in respect of date of emergence: *Welsh P.B.S.*

photoperiodic reactions in *Phalaris* and *Molinia*: *Welsh P.B.S.*

Strain Trials

see under Grassland *in* Subject Index, *page* 49

HOPS

Breeding and Genetics

breeding for wilt tolerance (in collaboration with *E. Malling*) and for resistance to downy mildew; induction of polyploidy, and cytological studies of polyploid plants; breeding of seedless triploids; genetical studies of wild and cultivated hops: *Wye College, Dept. of Hop Research*

Cultural Methods

systems of planting; times of cultivation; effects of dressing rootstocks at different times, of cutting bines at harvest time and of stripping at various heights during growth: *Exptl. Husb. Farm, Rosemaund*

long-term experiment on grassing-down: *Exptl. Husb. Farm, Rosemaund*

effect of time of cutting of bines: *Wye College, Dept. of Hop Research*

Diseases

Verticillium wilt—testing and propagation of resistant varieties (in collaboration with *Wye Coll.*); aetiology of the disease and host/pathogen relations; variation in the pathogen: *E. Malling*

virus diseases—aetiology and control; transmission and vectors; inactivation of viruses in the host by physical and chemical means: *E. Malling*

testing of various strains of fluctuating and progressive *Verticillium* wilt: *Exptl. Hort. Stn., Efford*

spraying for control of downy mildew: *Wye Coll., Dept. of Hop Research*

Drying

problems arising in the drying of machine-picked hops; sulphuring of hops during the drying process; effects of temperature of drying on market and brewing value: *Wye Coll., Dept. of Hop Research*

Nutrition

manurial experiment: *Exptl. Husb. Farm, Rosemaund*

field and pot experiments on mineral nutrition; long-term manurial experiments; effects of soil acidity; effects of grassing-down; micro-element nutrition of the hop plant, with special reference to *boron*; chemical identification of organic constituents of the plant, especially those likely to be connected with resin synthesis: *Wye Coll., Dept. of Hop Research*

Pests

soil application of systemic insecticides against hop aphis: *Wye Coll.*

Picking Machines

hop-picking machinery: *N.I.A.E.* (in collaboration with *Wye Coll.*)

Variety Trials

trials of new varieties: *Exptl. Husb. Farm, Rosemaund* (in collaboration with *Wye Coll.*)

KALE

Breeding and Genetics

breeding of improved forms of marrow-stem kale, and of a late-flowering short-stemmed thousand-head kale: *Pl. Br. Inst.*

genetics of self-compatibility and self-incompatibility and other problems affecting breeding structure; use of marker genes; *Pl. Br. Inst.*

examination of inter- and intra-specific brassica hybrids for their suitability as fodder kales: *Scottish P.B.S.*

potentiality trials with native and foreign strains of kale and rape; selection for winter hardiness; experiments on breeding technique: *Welsh P.B.S.*

Manuring

manuring of kales and rape for winter feed: *Grassland R.S.*

manurial experiments: *N.A.A.S., Provincial Centres*

Variety Trials

trials at Regional Trial Centres and in collaboration with *N.A.A.S.*: *N.I.A.B.*

Weed Control

spraying with sulphuric acid: *N.A.A.S., Provincial Centres*

field trials of new and established herbicides: *Unit Exptl. Agron.*

LETTUCE

Breeding

selection and breeding of summer lettuce for resistance to disease and to bolting: *N.V.R.S.*

Cultural Methods

various short-term cultural experiments: *Exptl. Hort. Stns.*

Diseases

Botrytis—effectiveness of certain newer fungicides: *N.V.R.S.*

mosaic—study of factors influencing seed transmission: *Pl. Path. Lab.*

Pests

lettuce root aphis—study of biology and ecology with a view to methods of control: *N.V.R.S.*

Variety Trials

trials at Regional Trial Centres and in collaboration with *Exptl. Hort. Stns.*: *N.I.A.B.*

LINSEED

variety trials at Regional Trial Centres: *N.I.A.B.*

variety trials in collaboration with *N.I.A.B.*: *Unit Exptl. Agron.*

LOGANBERRY

see under Blackberry

LUCERNE

Breeding and Genetics

improvement in yield, protein production and seed production of commercial types; development of a productive creeping type for pasture purposes; progeny testing by controlled crossing, polycrossing and inbreeding: *Pl. Br. Inst.*

genetical studies on the origin and breeding structure of cultivated lucernes: *Pl. Br. Inst.*

production of strains adapted to high rainfall; potentiality trials of strains; inheritance of flower colour: *Welsh P.B.S.*

selection and breeding for resistance to leafspot (*Pseudopeziza medicaginis*) and black stem (*Ascochyta imperfecta*): *Welsh P.B.S.*

Cultivation and Management

management and manuring of cocksfoot and lucerne in alternate rows: *Grassland R.S.*

timing of potash dressings and its effect on winter reserves: *Grassland R.S.*

effect of height of cutting on life and yield: *N.A.A.S., Eastern Province*

manurial experiments: *N.A.A.S., Provincial Centres*

establishment—causes of low germination of seed, and methods of improving initial germination; field establishment of lucerne of different germinating ability at different seed rates: *N.I.A.B.*

effect of time of cutting on seasonal yield of nutrients: *N.I.A.B.*

variety and management trials: *N. Scot. Coll.*

agronomic study of lucerne and lucerne mixtures under different systems of management: *Welsh P.B.S.*

strain and management trials: *W. Scot. Coll.*

Diseases

Verticillium wilt of lucerne: *Swansea Univ. Coll., Dept. of Botany* (R.G.)

Seed Production

pre-harvest defoliants—dates of spraying: *Grassland R.S.*

factors affecting seed setting; techniques of seed production; germination: *N.I.A.B.*

Strain Trials

sward trials of strains; trials of resistance to *Verticillium* wilt: *Grassland R.S.*

identification studies of lucerne strains; strain trials at Regional Trial Centres and in collaboration with *N.A.A.S.* at *Exptl. Husb. Farms* and *Provincial Centres*; investigation of leaf-stem ratio: *N.I.A.B.*

Weed Control

control of weeds in young lucerne leys: *Exptl. Husb. Farm, Bridget's* (in collaboration with *Unit Exptl. Agron.*)

effects of selective weedkillers: *Grassland R.S.* (in collaboration with *Unit Exptl. Agron.*)

field trials of new and established herbicides: *Unit Exptl. Agron.*

MAIZE

experiments in collaboration with *Unit Exptl. Agron.—Eastern* and *South Eastern Provinces*: *N.A.A.S.*

trials of American and other varieties and hybrids for their suitability as a crop in England (*a*) for grain (*b*) for ensilage: *N.I.A.B.*

agronomic investigations of maize for grain and for ensilage; variety testing in collaboration with *N.I.A.B.* and *N.A.A.S.*: *Unit Exptl. Agron.*

isolation and testing of early maturing, cold-tolerant inbred lines: *Unit Exptl. Agron.*

MANGOLD

manurial experiments: *N.A.A.S., Provincial Centres*

MUSHROOM

studies of casing soils: *Glasshouse Crops*

mushroom diseases: *Glasshouse Crops*

eelworm—biology of *Ditylenchus destructor* in mushroom spawn and other hosts: *Rothamsted*

OATS

see also Cereals

Breeding and Genetics

breeding for ecological adaptability, high percentage of kernel, resistance to lodging, and resistance to mildew; field trials of local and introduced varieties; survey of origin, quantity and variety of seed throughout Northern Ireland: *N. Ireland*

winter oats—breeding of improved types showing winter-hardiness combined with strong straw, high yield, and good feeding quality in terms of low husk percentage and high oil content; development of a freezing test as an aid to selection for winter hardiness: *Pl. Br. Inst.*

spring oats—breeding of improved general-purpose types combining high yield, strong straw and good feeding quality; breeding for resistance to frit fly: *Pl. Br. Inst.*

breeding within the hexaploid species with emphasis on general-purpose varieties; studies of performance of segregating families at several selection centres, to establish the attributes contributing to the suitability of the material as potential general-purpose or special-purpose varieties: *Scottish P.B.S.*

interspecific hybridization with the main object of producing hexaploid oats deriving a tolerance of alkaline conditions from the diploid *Avena strigosa*: *Scottish P.B.S.*

cytogenetical studies of *Avena*: *Univ. Coll. Wales, Dept. of Agric. Botany* (R.G.) (in collaboration with *Welsh P.B.S.*)

breeding of winter oats combining short straw, heavy yield, and white grain of good quality, and possessing resistance to stem eelworm, mildew and crown rust: *Welsh P.B.S.*

breeding of special-purpose spring oats in three categories, for conditions of high, medium and low fertility: *Welsh P.B.S.*

breeding for improved protein and oil content: *Welsh P.B.S.*

search for resistance to cereal root eelworm: *Welsh P.B.S.*

cytogenetical studies of interspecific crosses; synthesis of hexaploids through hybridization and colchicine treatment; induction of mutations in winter oats by X-ray treatment: *Welsh P.B.S.*

panicle and straw characters in relation to grain production; inheritance of panicle and grain characters in hybrid material: *Welsh P.B.S.*

Diseases

investigation of leafspot and diseases caused by *Fusarium* spp.; seed health survey; testing of seed disinfectants; fungus flora of seed oats; *N. Irelana*

Harvesting

combine harvesting; drying and storage: *N.I.A.E.* (*Scot.*)

Husbandry

varying seed rates and levels of nitrogen: *Exptl. Husb. Farms*

seed rates, date of sowing, and other husbandry factors: *N.A.A.S., Provincial Centres*

interactions of varieties and manurial levels: *N. Ireland*

Manuring and Nutrition

manganese deficiency—pot culture investigation of 'grey speck': *E. Scot. Coll.*

performance of varieties at various levels of manuring: *Exptl. Husb. Farms, Rosemaund, Terrington*

varying levels of nitrogen and of phosphate; response of oats to manganese: *N.A.A.S., Provincial Centres*

quantity and time of application of nitrogen: *N. Scot. Coll.*

manurial experiments, particularly with nitrogen: *W. Scot. Coll.*

Pests

frit fly

control of frit fly by spraying: *Exptl. Husb. Farm, Gleadthorpe*

assessment of damage; use of DDT sprays on late-sown oats: *N.A.A.S., Advisory Entomologists*

root eelworm

effects of different rotations on numbers of cysts and yields of oats: *Exptl. Husb. Farm, Gleadthorpe*

observations on varietal resistance to root eelworm: *Welsh P.B.S.* (in collaboration with *N.A.A.S.*)

stem eelworm
effect of fertilizers on damage and spread: *N.A.A.S., Wales*

testing of varietal susceptibility: *N.I.A.B.* (in collaboration with *Rothamsted*)

investigations of oat varieties for resistance: *N. Ireland*

distribution in the north of Scotland; trials with resistant oats: *N. Scot. Coll.*

Straw
composition and feeding value of oat straw: *N.I.A.B.*

Variety Trials
see also Cereals

field trials of local and introduced varieties: *N. Ireland*

Weed Control
susceptibility of oat varieties to damage by weed-killing sprays: *N. Scot. Coll.*

effects of MCPA on yield of oats: *W. Scot. Coll.*

ONION

Breeding
bunched onions—selection and breeding for resistance to diseases: *N.V.R.S.*

bulb onions—selection and breeding for high yield and improved quality, using male sterility and hybrid vigour; selection, trials and propagation of promising new varieties; reselection and maintenance of nucleus stock of varieties already distributed: *N.V.R.S.*

Physiology
factors determining bulbing of onions: *Res. Inst. Pl. Phys.*

Variety Trials
trials at Regional Trial Centres and in collaboration with *Exptl. Hort. Stns.*: *N.I.A.B.*

PARSNIP

Diseases
parsnip canker—studies of the disease under conditions ensuring freedom from carrot-fly attack, of the effect of injury, of the resistance mechanism, and of possible pathogens; testing for resistant lines: *N.V.R.S.*

Pests
carrot fly—biology, ecology and incidence of the carrot fly on parsnips; methods of field control: *N.V.R.S.*

PEACH

rootstock trials and studies of peaches suitable for cultivation in the open: *E. Malling*

PEAR

Breeding

selection of new varieties bred for specific needs: *E. Malling*

establishment and maintenance of a collection of *Pyrus* species for breeding purposes: *John Innes*

observations on mid-season and late seedling varieties: *Long Ashton*

Diseases

scab—collection and study of strains of *Venturia* spp.; variation in pathogenicity and causes of host resistance: *E. Malling*

scab—trials of fungicides for control: *Long Ashton*

Rootstocks

rootstock/scion relations; testing of quinces for compatibility: *E. Malling*

survey of *Crataegus* and *Cotoneaster* species as rootstocks for pears: *Long Ashton*

investigation of certain graft incompatibilities: *Long Ashton*

Varietal Studies

studies of new dessert varieties: *E. Malling*

identification and description of perry pears; survey of perry pears of the West Midlands: *Long Ashton*

maintenance of variety collection; trials of new varieties, at headquarters and at *Luddington*: *Nat. Fruit Trials*

PEAS

Breeding and Genetics

development by selection, and by crossing spring and winter types, of improved winter-hardy Maple and Dun types: *Pl. Br. Inst.*

breeding of improved spring Maple types, particularly for higher yield: *Pl. Br. Inst.*

Diseases

fungicidal seed dressings and soil treatments: *N.A.A.S., East Midland Province*

seed treatment for control of *Ascochyta*: *N.V.R.S.*

wilt and foot-rot caused by *Fusarium* spp.; correlation between pathogenicity and biochemical behaviour of *Fusarium* isolates; ability of soil actinomycetes to interfere with the growth of the fungus: *Rothamsted*

Husbandry

seed rates, seed dressings and time of drilling: *Exptl. Husb. Farm, Terrington*

time of sowing: *N.A.A.S., Yorks. and Lancs. Province*

Manuring

responses to fertilizers: *N.A.A.S., Provincial Centres*

nitrogen manuring of vining peas: *Norfolk*

Pests

control of pea moth by DDT: *N.A.A.S., South Eastern Province*

population studies of pea root eelworm: *Rothamsted*

Variety Trials

trials of winter-hardy selections for production of grain and green fodder: *N.I.A.B.*

classification of garden peas: *N.I.A.B.*

Weed Control

selective weed control in picking peas (in collaboration with *N.V.R.S.*): *Exptl. Hort. Stns., Efford, Luddington, Stockbridge House*

chemical weed control in peas: *Exptl. Husb. Farm, Terrington* (in collaboration with *Unit Exptl. Agron.*)

effect of soil temperature on development and emergence of pea moth: *N.V.R.S.*

control of wild oats in peas: *N.A.A.S., Eastern Province*

weed control in peas: *Norfolk*

effects of selective herbicides on peas: *Unit Exptl. Agron.*

PLUM

Breeding and Genetics

production of an extended range of rootstocks for specific purposes: *E. Malling*

collection of species in the genus *Prunus* and hybridization between them for gene transfer and genome analyses: *John Innes*

observations on seedling varieties: *Long Ashton*

Diseases

silver leaf—control by injection of fungicides and by improved plantation methods: *E. Malling*

bacterial canker—study of pathogen, aetiology and control: *E. Malling*

bacterial canker—properties of *Pseudomonas mors-prunorum*; transmission and infection; control measures: *E. Scot. Coll.*

bacterial canker—spraying trial: *Exptl. Hort. Stn., Luddington* (in collaboration with *E. Malling*)

bacterial canker—stembuilder trial (planted 1954): *Exptl. Hort. Stn., Luddington* (in collaboration with *E. Malling*)

bacterial canker—infection in relation to methods of tree building: *Long Ashton*

brown rot—factors influencing infection; trials of fungicides for control: *Long Ashton*

Fruit Thinning

trials with chemical thinning agents: *Long Ashton*

Nutrition

long-term manurial experiment (planted 1954) in collaboration with *Long Ashton*: *Exptl. Hort. Stn., Luddington*

effect of cover crops and fertilizers on tree growth, yield and leaf nutrient status—long-term experiment at *Luddington* in collaboration with *N.A.A.S.*: *Long Ashton*

Pruning

pruning in relation to branch breakage and incidence of silver leaf: *E. Malling*

Rootstock Trials

rootstock/scion relations; testing of new clones for vigour, precocity and compatibility: *E. Malling*

comparison of seven rootstocks worked with two scion varieties (planted 1952): *Exptl. Hort. Stn., Luddington*

observations of several plum varieties high and low worked on Myrobalan B: *Long Ashton*

Varietal Studies

studies of important new varieties: *E. Malling*

comparison of established dessert and culinary varieties (planted 1952); comparison of damson varieties (1954): *Exptl. Hort. Stn., Stockbridge House*

flowering dates, growth and cropping of dessert and culinary plums: *Long Ashton*

maintenance of variety collection; trials of new varieties, at headquarters and at *Luddington*: *Nat. Fruit Trials*

observational trial (planted 1953) to determine varieties and rootstocks suitable to Scottish conditions: *Scot. Hort. R.I.*

trials conducted co-operatively by *Scottish Hort. R.I., E. Scot. Coll., N. Scot. Coll. and W. Scot. Coll.*: *Scot. Nat. Fruit Trials*

POPPY

effects of weather on morphine content: *Exptl. Husb. Farm, Trawscoed* (in collaboration with *Unit Exptl. Agron.*)

variety trials in collaboration with *Unit Exptl. Agron*: *N.A.A.S., East Midland Province*

harvesting machinery: *N.I.A.E.*

variety and manurial trials: *Norfolk*

agronomic investigations; selection of strains with high morphine content and high seed yield; development of methods of morphine analysis: *Unit Exptl. Agron.*

POTATO

Breeding and Genetics

inheritance of frost resistance in the potato: *Birmingham Univ., Dept. of Botany* (R.G.)

maintenance and survey of the Commonwealth Potato collection: *John Innes*

cytogenetical studies of cultivated and wild potato relatives—analysis of crossability of species; study of inherent characteristics; transmission of useful qualities by hybridization between species and domestic varieties; development of tetraploid breeding lines: *John Innes*

breeding for resistance to blight (*Phytophthora infestans*); laboratory methods for testing field resistance and tuber resistance: *Pl. Br. Inst.*

breeding for resistance to root eelworm (*Heterodera rostochiensis*); combination of resistance with good yield of large tubers, wart immunity, and other desirable features; investigation of field behaviour of resistant seedlings: *Pl. Br. Inst.* (in co-operation with *Cambridge Univ., School of Agriculture*)

breeding for resistance to virus diseases: *Pl. Br. Inst.*

breeding from Majestic and King Edward with particular attention to high yield and good tuber shape and quality: *Pl. Br. Inst.*

breeding for combination of resistance to various diseases, including blight and virus diseases, with commercial characters; breeding for resistance to root eelworm: *Scottish P.B.S.*

examination of cultivated varieties and exotic species for attributes of agronomic value to be used in construction of parental material: *Scottish P.B.S.*

investigation into the nature and causes of variations within varieties: *Scottish P.B.S.*

inheritance of resistance to blight; nature and inheritance of resistance to root eelworm, and of resistance to virus diseases: *Scottish P.B.S.*

Diseases

blight

economics of spraying of the seed potato crop; blight forecasting: *E. Scot. Coll.*

laboratory testing and field observation of varietal susceptibility; identification of physiological races of *Phytophthora infestans*; behaviour of potato strains of the fungus when grown on tomato: *N.I.A.B.*

control; investigation of physiologic races of *Phytophthora infestans*; testing for varietal resistance: *N. Ireland*

strain determinations of isolates found on breeding material: *Pl. Br. Inst.*

forecasting of outbreaks; regional and seasonal surveys; world survey of epidemics: *Pl. Path. Lab.*

epidemiology and control of potato blight: *Rothamsted*

physical studies of condensation on and evaporation from potatoes, with particular application to the study of blight: *Rothamsted*

micro-climate of potatoes: *Rothamsted*

field experiments on the effect of control measures in relation to the phenology of the disease: *Rothamsted*

problems relating to the origin, classification, and stability of physiologic races of *Ph. infestans*: *Scottish P.B.S.*

tests of fungicides for control: *W. Scot. Coll.*

common scab

effects of chemicals on common scab: *Exptl. Husb. Farm, Gleadthorpe*

trials of chemicals for control: *N.A.A.S., East Midland Province*

regional and seasonal surveys: *Pl. Path. Lab.*

laboratory test for susceptibility: *Pl. Reg. Stn., D.A.S. Pl. Path. Service*

dry rot

varietal susceptibility; soil infestation; chemical and cultural control: *E. Scot. Coll.*

incidence of tuber rots; study of the fungi causing dry rot; antagonistic action of growth of *Streptomyces scabies* on *Fusarium* spp.: *N. Ireland*

miscellaneous

pit rot—association with bacterial soft rot: *E. Scot. Coll.*

skin spot—varietal susceptibility and control: *E. Scot. Coll.*

trials for control of gangrene: *N. Scot. Coll.*

techniques for testing susceptibility to various tuber diseases: *Pl. Reg. Stn., D.A.S. Pl. Path. Service*

skin spot—incidence and importance of *Oospora pustulans*: *Rothamsted*

virus diseases

insecticidal treatment of the early crop for control of vectors; possibility of saving seed: *Exptl. Hort. Stn., Efford*

control of virus spread by spraying: *Exptl. Husb. Farm, High Mowthorpe*

control of spread of potato virus diseases by spraying against aphids: *N.A.A.S., Provincial Centres* (in collaboration with *Rothamsted*)

testing potato varieties for resistance and tolerance to the commoner virus diseases; effects of various storage and cultural treatments on the degeneration of stocks infected with leaf roll: *N.I.A.B.*

control of spread of infection by spraying: *Norfolk* (in co-operation with *Rothamsted*)

testing of potato stocks for freedom from common viruses; varietal reaction to strains of virus Y: *N. Ireland*

methods of evaluating rate of spread: *Pl. Path. Lab.*

rate of infiltration of virus X into selected virus-tested stocks; period of active spread of leaf roll: *Pl. Reg. Stn., D.A.S. Plant Path. Service*

control of potato virus diseases by the use of insecticides: *Rothamsted*

biology of potato aphids in relation to the spread of potato virus diseases in Scotland: *Scot. Hort. R.I.*

effects of cultural treatments on the spread of potato rugose mosaic and leaf roll: *Scot. Hort. R.I.*

factors conditioning hypersensitiveness to viruses; comparison of pathogenicities, physical characters and serological relationships of virus strains; field studies of spread of viruses in commercial stocks: *Scottish P.B.S.*

distribution, manner of spread, and economic significance of virus S: *Scottish P.B.S.*

Harvesting

factors affecting efficiency of picking potatoes, including effect of different types of conveyor: *N.I.A.E.*

study of mechanical factors causing damage during harvesting: *N.I.A.E.*

development of disc and spider mechanism and its incorporation into a simple complete harvester for the small grower: *N.I.A.E.*

survey of damage to potatoes in harvesting, pitting, grading and transport; picking belt efficiency under field conditions; devices for separating potatoes from stones and clods: *N.I.A.E.* (*Scot.*)

factors affecting grading efficiency; development of an improved grader; assessment of damage done by graders and examination of the causes: *N.I.A.E.* (*Scot.*)

design of a stone separator for potato harvesters: *N. Scot. Coll.*

Husbandry Methods and Manuring

methods of fertilizer placement for potatoes planted by machine and by hand: *Exptl. Husb. Farm, Terrington*

fertilizers required for potatoes on wold soil; residual effects on other crops of a five-course arable rotation: *Exptl. Husb. Farm, High Mowthorpe*

use of artificial light to restrict excessive sprouting of seed: *N.A.A.S., Eastern Province*

spacing for maximum yield at very early lifting; spacing for maximum yield of seed-size tubers: *N.A.A.S., Wales*

effect of varying spacing in the row: *N.A.A.S., Yorks and Lancs. Province*

various manurial experiments, including placement trials: *N.A.A.S., Provincial Centres*

effects of various storage and cultural treatments on yield of early varieties: *N.I.A.B.*

manurial trials: *Norfolk*

fertilizer placement: *N. Scot. Coll.* (in collaboration with *Macaulay*)

various agronomic experiments: *Nottingham Univ., School of Agriculture* (R.G.)

effects of cultivation and of organic and inorganic manures on potatoes in rotation experiments: *Rothamsted*

effect of dung, and its interactions with N, P, K: *Rothamsted*

overhead irrigation of main-crop potatoes (at *Woburn*): *Rothamsted*

Pests

aphids

bionomics of aphids associated with potatoes: *N. Scot. Coll.*

factors influencing the spread of aphids within the potato crop: *Nottingham Univ., Dept. of Agric. Sciences* (R.G.)

seasonal and regional fluctuations of aphid populations on potatoes: *W. Scot. Coll.*

other references: virus diseases, *above*

root eelworm

resistance of certain lines of *Solanum andigenum*: *Cambridge Univ., School of Agriculture* (R.G.)

factors influencing hatching: *E. Scot. Coll.*

experiments in control: *N.A.A.S., Advisory Entomologists*

screening, by nematological tests, of potato varieties bred for resistance: *N. Ireland*

distribution in the north of Scotland: *N. Scot. Coll.*

longevity of cysts under permanent grass; effect of use of DD soil fumigant: *Pl. Reg. Stn., D.A.S. Helminthology Section*

population changes in rotation experiments; the production, diffusion and breakdown of root diffusate; biology of infestation; host reactions; use and effects of nematicides: *Rothamsted*

isolation of hatching factor from root diffusate: *Rothamsted*

control by nematicides; mixing of nematicides with soil; use of radioactive tracers to test efficiency of mixing: *W. Scot. Coll.*

other references: Eelworms *under* Plant Pests *in* Subject Index, *page* 30

wireworms

damage assessment: *Pl. Path. Lab. and N.A.A.S.*

Quality

nutrient ratios in relation to yield and quality: *E. Scot. Coll.*

tainting effects of soil insecticides: *Exptl. Husb. Farms, Gleadthorpe, High Mowthorpe, Rosemaund*

factors determining quality in potato varieties: *N.I.A.B.*

Variety Trials

trials (including observations of varietal susceptibility to diseases and assessment of varietal differences in quality) at Regional Trial Centres and in collaboration with *N.A.A.S.* at *Exptl. Husb. Farms, Exptl. Hort. Stns.*, and *Provincial Centres*: *N.I.A.B.*

registration trials of new varieties—yield tests, botanical descriptions, assessment of quality, tests of resistance to diseases; variety identification: *Pl. Reg. Stn.*

Weed Control

use of selective weedkillers: *N. Scot. Coll.*

RADISH

selection and breeding of forcing radish for uniformity and reduced bolting: *N.V.R.S.*

RAPE

manuring of oil-seed rapes: *Exptl. Husb. Farm, Bridget's*

relationship between fertility and seed rate: *Exptl. Husb. Farm, Trawscoed*

response to various fertilizers: *N.A.A.S., Provincial Centres*

variety trials of spring and winter rapes; observations on other oilseed crops: *N.I.A.B.*

studies of commercial stocks preliminary to breeding for late winter and early spring grazing; comparison with late flowering thousand-head kale: *Pl. Br. Inst.*

crossing of *Brassica rapa* and *B. oleracea*: *Scottish P.B.S.*

agronomic investigation of spring and winter rape as oilseed crops: *Unit Exptl. Agron.*

potentiality trials with strains of kale and rape: *Welsh P.B.S.*

RASPBERRY

Breeding and Genetics

raising and selection of seedlings; study of selfed races; breeding of virus-sensitive varieties; uses of interspecific crosses in breeding commercial types: *E. Malling* (in collaboration with *Scot. Hort. R.I.*)

studies of quantitative characters and combining ability: *John Innes*

breeding, especially for combination of firmness of berry with commercial quality and yield: *Scot. Hort. R.I.* (in collaboration with *E. Malling*)

Cultural Methods

use of mulches, and effects of soil moisture level on growth and cropping: *E. Malling*

influence of cultural factors on growth, yield and fruit quality: *Scot. Hort. R.I.*

Diseases

virus diseases—comprehensive studies of aetiology and control: *E. Malling*

investigation of die-back, cause and control: *E. Scot. Coll.*

control of spur blight: *N.A.A.S., South Western Province*

testing of stocks for freedom from virus infection: *N. Ireland*

propagation of virus-tested stocks: *N. Ireland*

cane spot (*Elsinoe*)—biology and control: *Scot. Hort. R.I.*

virus diseases—aphid-transmitted viruses and their spread; properties, relationships and modes of spread of ringspot viruses, especially those causing leaf curl; survey of virus diseases on *Rubus* spp.; heat therapy: *Scot. Hort. R.I.*

Nutrition

relations between growth, yield and leaf nutrient status—long-term fertilizer experiment: *Long Ashton*

Pests

biology and field control of Capsidae: *Scot. Hort. R.I.*

Physiology

growth pattern of raspberry varieties in the field: *Scot. Hort. R.I.*

Variety Trials

cropping trials of new East Malling seedlings: *E. Malling* (in collaboration with *Scottish Hort. R.I.*)

cropping trials in collaboration with *E. Malling*: *N.A.A.S., Eastern and East Midland Provinces.*

tests of new varieties, at *Nat. Fruit Trials* headquarters and at *Exptl. Hort. Stns.*

field trials of new varieties: *Scot. Hort. R.I.*

trials conducted co-operatively by *Scottish Hort R.I., E. Scot. Coll., N. Scot. Coll.* and *W. Scot. Coll.*: *Scot. Nat. Fruit Trials*

RED CURRANT

Variety Trials

tests of new varieties, at headquarters and at *Exptl. Hort. Stns.*: *Nat. Fruit Trials*

RHUBARB

long-term manurial experiment on rhubarb and rotation crops, started 1952; spacing experiment; collection and observation of varieties in museum plots; comparison of commercial strains of standard varieties: *Exptl. Hort. Stn., Stockbridge House*

virus diseases of rhubarb, their field spread and effects on yield: *N.V.R.S.*

ROSES

collection and cytological study of the genus *Rosa* and of garden roses; study of rootstocks for roses: *John Innes*

study of rose diseases; control of rust, black spot and mildew; varietal susceptibility: *N. Ireland*

fungicidal treatment of briars and its effect on die-back of young roses: *N. Scot. Coll.*

RUBUS BERRIES

for *Rubus* spp. other than raspberries, *see under* Blackberry

RYE

variety trials: *N.I.A.B.*

RYEGRASS

see under Grasses

SAINFOIN

classification and identification of strains: *N.I.A.B.*

development of strains based on habit, protein production and seed production; study of artificially induced octoploid forms; progeny testing by polycrossing and inbreeding: *Pl. Br. Inst.*

selection of high-yielding persistent types; investigation of seed setting in the greenhouse: *Welsh P.B.S.*

SOFT FRUIT

see also Blackberry, Black Currant, Blueberry, Gooseberry, Raspberry, Red Currant, Strawberry

diseases—*Verticillium* wilt diseases of fruit; tolerant varieties; host/pathogen relations; variation in the pathogen: *E. Malling*

aetiology and control of virus diseases of soft fruits: *E. Malling*

frost damage—varietal susceptibility, factors affecting damage, and means of prevention: *E. Malling*

pests—systematic and biological studies and control of aphids on soft fruit: *E. Malling*

effect of cultural practices on midge attack on soft fruits: *Long Ashton*

nutrition—control of iron deficiency by chelating compounds: *N.A.A.S., South Eastern Province*

bird damage—tests of various repellents, as sprays, greases and solids, against bird attacks on fruit lands (in co-operation with *Infest. Control*): *N.A.A.S., South Eastern Province*

biology of capsids attacking soft fruit in Scotland: *Scot. Hort. R.I.*

virus diseases—heat therapy of infected soft fruit plants: *Scot. Hort. R.I.*

STRAWBERRY

Breeding and Genetics

hybridization and selection for yield, quality and resistance to diseases; genetics of June Yellows; collection of species of *Fragaria* and hybridization between them: *John Innes*

cytogenetical studies of *Fragaria*: *Manchester Univ., Dept. of Botany* (R.G.)

breeding with special reference to resistance to red core disease; search for new genetical sources of resistance; inheritance of resistance: *Scot. Hort. R.I.*

genetical and cytogenetical studies; genetical aspects of the 'yellows' complex: *Scot. Hort. R.I.*

Cultural Methods

spaced and matted-bed planting systems: *E. Malling*

effects of soil moisture level on growth and cropping, including interaction with nitrogen supply: *E. Malling*

Diseases

red core—studies of physiologic races of *Phytophthora fragariae*: *Birmingham Univ., Dept. Botany and Unit Biomet. Gen.*

Botrytis rot, control by spraying: *E. Malling*

'cauliflower' and related diseases (*Corynebacterium fascians*)—aetiological relationship with eelworm infestation: *E. Malling*

virus diseases—comprehensive studies of aetiology and control: *E. Malling*

spraying for control of *Botrytis*: *Exptl. Hort. Stn., Luddington* (in collaboration with *E. Malling* and *Long Ashton*)

field spraying trials against *Botrytis*: *Long Ashton*

effects of organic fungicide residues on processing qualities of the fruit: *Long Ashton*

evaluation of griseofulvin in the control of diseases: *N.A.A.S., South Western Province*

study of red core and June Yellows; testing of stocks for freedom from virus infection; propagation of virus-tested stocks: *N. Ireland*

red core—biological studies of *Phytophthora fragariae*: *Scot. Hort. R.I.*

grey mould (*Botrytis*)—biology and control: *Scot. Hort. R.I.*

yellows—studies of case histories; genetical aspects of the disorder: *Scot. Hort. R.I.*

Nutrition

long-term manurial experiments: *Exptl. Hort. Stns., Efford, Rosewarne* (in collaboration with *Long Ashton*)

relations between growth, yield and leaf nutrient status—long-term manurial experiments at *Exptl. Hort. Stns.*: *Long Ashton* (in collaboration with *N.A.A.S.*)

Pests

aphids—control in fruiting and runner beds; incidence of virus in runner beds after routine spraying; rate of spread; factors influencing variations in populations: *E. Malling*

eelworms—interaction with bacteria in producing disease symptoms; pure culture studies; persistence in soil; control; root lesion nematodes in relation to root rots: *E. Malling*

ground beetles—biology and control: *E. Malling*

Physiology

influence of temperature on response to photoperiod; physiology of runner production; cold storage of runners for out-of-season planting; studies of growth habit of new varieties in the field: *Scot. Hort. R.I.*

Root Studies

mycorrhizal relations of strawberry: *E. Malling*

Variety Trials

cropping trials of varieties; tests of heat-treated clones: *E. Malling*

tests of new varieties against standard varieties of the same group, at *Nat. Fruit Trials* headquarters and at *Exptl. Hort. Stns.*

yield trials of recent Auchincruive selections: *Scot. Hort. R.I.*

conducted co-operatively by *Scottish Hort. R.I., E. Scot. Coll., N. Scot. Coll.* and *W. Scot. Coll.*: *Scottish Nat. Fruit Trials*

Weed Control

use of weedkillers in strawberry beds: *E. Malling*

effects of phenoxybutyric herbicides on strawberry plants: *N.A.A.S., South Western Province*

SUGAR BEET

Note: much of the research on this crop is financed and co-ordinated by the *Sugar Beet Research and Education Committee*

Breeding and Genetics

development, study and testing of productive lines resistant to bolting; search for resistance or tolerance to virus yellows; development of lines with reduced number of seeds per cluster: *Pl. Br. Inst.*

investigation of breeding techniques—induced autopolyploidy; controlled pollination and seed production under glass; shortening of the breeding cycle by growing under controlled conditions; inbreeding and exploitation of hybrid vigour; production of interspecific amphidiploids for transfer of disease resistance: *Pl. Br. Inst.*

laboratory studies of quality of beet juices to increase the efficiency of selection techniques: *Pl. Br. Inst.*

testing of local selections and Cambridge material for resistance to bolting when sown early in Scotland; strain-building, with the primary object of producing non-bolting strains: *Scottish P.B.S.*

Cultural Operations

cultivation and manurial experiments: *N.A.A.S., Provincial Centres*

investigation of mechanical thinners: *N.I.A.E.*

cultural methods to increase the ease and speed of singling; mechanical thinning; mechanical and chemical control of weeds: *Norfolk*

Diseases

factors responsible for strangles: *E. Scot. Coll.*

seedling diseases—effect of seed treatments for control: *Rothamsted*

virus diseases—relationships of the various viruses that cause yellowing in sugar beet, and their transmission by aphids: *Rothamsted*

incidence and control of virus yellows in root crop, stecklings and seed crop; tests of breeding material for resistance; experiments with systemic insecticides for control of yellows; control of aphis in mangold and fodder beet clamps: *Rothamsted*

Harvesting

dirt tare investigation—clamping experiments in different types of soil; effects of storing beet at different levels of dirt tare and damage: *N.I.A.E.*

Irrigation

effects of overhead irrigation on farm crops including sugar beet in rotation (at *Woburn*): *Rothamsted*

Manuring

effect of foliar applications of P and K on the sugar content and sugar yield: *Exptl. Husb. Farm, Kirton*

various manurial experiments: *N.A.A.S., Provincial Centres*

comparison of different forms of nitrogenous fertilizer and times of application; comparison of phosphates and potash ploughed in or broadcast: effect of dung and its interaction with fertilizers: *Rothamsted*

Pests

eelworm—factors affecting population increase; effects of crop rotation and of various host and non-host plants on soil populations; comparison of increase rates in different soil types; screening tests for assessment of resistance in beets: *Cambridge Univ., School of Agriculture*

insect pests—incidence, life-cycles, parasitism and general biology of sugar beet pests; low-volume spraying against leaf-feeding pests; seed dressing against soil insects: *Cambridge Univ., School of Agriculture*

population studies of beet eelworm: *Rothamsted*

Variety Trials

variety trials, including quality assessment, time of sowing trials, and observations on bolting in early-sown plots, at *N.I.A.B.* Regional Trial Centres and in collaboration with the *British Sugar Corporation* and with *Terrington*

variety trials: *W. Scot. Coll.*

Weed Control

spraying experiments: *N.A.A.S. Provincial Centres* (in collaboration with *Unit Exptl. Agron.*)

tests of selective weedkillers and methods of application: *Norfolk* (in collaboration with *Unit Exptl. Agron.*)

effects of new and established chemicals for weed control: *Unit Exptl. Agron.*

SWEDE

Breeding and Genetics

development of commercial varieties from crosses between inbred lines; relative merits of parental populations and inter-line hybrids; trials for clubroot resistance and for winter hardiness: *Scottish P.B.S.*

Diseases

varietal susceptibility to clubroot: *N.I.A.B.*

Manuring

recovery of phosphorus from various phosphatic fertilizers by swedes or turnips grown on phosphate-deficient soils: *E. Scot. Coll.*

various manurial experiments: *N.A.A.S., Provincial Centres*

experiments with phosphatic manures and lime: *W. Scot. Coll.*

Pests
trials for control of midge: *N.A.A.S., Provincial Centres*

Variety Trials
N. Scot. Coll.

W. Scot. Coll.

SWEET CORN

variety trials and cultural treatments: *Exptl. Hort. Stns.*

concluding tests on new inbred lines: *John Innes*

TIMOTHY

see under Grasses

TOMATO

Breeding and Genetics
breeding and genetical studies: *Glasshouse Crops*

genetical studies—cytoplasmic inheritance in tomatoes; the physiology and genetics of resistance to *Cladosporium fulvum*: *John Innes*

breeding of male sterile lines suitable for the production of F_1 hybrids: *John Innes*

breeding of winter-fruiting lines resistant to leaf mould: *John Innes*

genetics of the 'suppressed lateral' mutant, and its improvement for economic use: *John Innes*

breeding for resistance to *Cladosporium* leaf mould: *W. Scot. Coll.*

Cultural Methods
various cultural experiments: *Exptl. Hort. Stns., Efford, Fairfield, Stockbridge House*

varietal differences in response of tomatoes to supplementary illumination by mercury vapour lamps: *Exptl. Hort. Stn., Fairfield*

various experiments on glasshouse tomatoes: *Exptl. Husb. Farm, Terrington*

effects of various cultural and soil treatments: *Glasshouse Crops*

water relations of plants growing under glass, with special reference to the tomato: *Nottingham Univ., Dept. of Horticulture* (R.G.)

trials of various cultural techniques: *W. Scot. Coll.*

Diseases
trial of inhibitors for controlling spread of virus: *Exptl. Hort. Stns., Efford, Fairfield*

Didymella stem rot—use of formaldehyde to eliminate the fungus from infected soil; factors preventing the establishment of *D. lycopersici* in certain soils; tests of organisms antagonistic to the fungus: *Glasshouse Crops*

Didymella stem rot—trials of new fungicides for control: *Glasshouse Crops*

root rot—root culture studies of organisms isolated from diseased roots; examination of roots from various types of soil; varietal susceptibility: *Glasshouse Crops*

control of stem infections of grey mould: *N.A.A.S., South Western Province*

studies of *Didymella* stem rot of outdoor tomatoes: *N.V.R.S.*

Didymella stem-rot control; leaf mould control by spraying and the use of resistant varieties: *N. Ireland*

varietal susceptibility to leaf mould and grey mould: *N. Scot. Coll.*

factors affecting the spread of tomato spotted wilt by thrips: *Rothamsted*

use of substances that inhibit virus infection to control tomato mosaic: *Rothamsted* (in collaboration with *N.A.A.S.*)

Nutrition

long-term experiment in conditioning of glasshouse soil for growth of tomatoes: *Exptl. Hort. Stns., Efford, Fairfield*

effects of different organic soil treatments: *N.A.A.S., East Midland Province*

effects of nutrient applications on advent and severity of blotchy ripening and bronzing: *N.A.A.S., South Western Province*

Pests

control of tomato root eelworm by fumigants: *N. Scot. Coll.*

Physiology

comparison of the auxin content of normal and parthenocarpic tomatoes: *Long Ashton*

basal constituents of tomato plants in relation to mineral status—major and micro-nutrients: *Unit Pl. Nutr.*

Root Studies

growth of roots in the glasshouse border in relation to growth and fruiting of the plant above ground; studies of root environment, especially soil moisture: *Glasshouse Crops*

Variety Trials

comparison of F_1 hybrid varieties: *Exptl. Hort. Stns., Efford, Fairfield*

tests of new hybrids resistant to leaf mould: *Exptl. Husb. Farm, Terrington* (in collaboration with *John Innes*)

tests of outdoor tomatoes, at *N.I.A.B.* Regional Trial Centres and in collaboration with *Exptl. Hort. Stns.*

TOP FRUIT

see also Apple, Cherry, Peach, Pear, Plum, Walnut

Anatomy and Histology

structure of stems and roots in relation to rootstock vigour and precocity, ease of propagation, mechanical strength and resistance to pests and diseases; anatomical effects of cultural treatments, such as pruning, disbudding, and bending; histology of rootstock/scion incompatibility; rubbery wood in apple trees; mycorrhizal relations of apple and plum: *E. Malling*

Breeding and Genetics

breeding of apples and pears, and of rootstocks for top fruits: *E. Malling*

breeding of self-fertile fruit trees: *John Innes*

establishment of a collection of species of *Malus*, *Pyrus* and *Prunus*; interspecific hybrids in those genera for gene transference and genome analyses: *John Innes*

observations on seedling varieties raised at the station: *Long Ashton*

Diseases

bacterial canker of stone fruits: *E. Malling*

virus diseases—aetiology and control: *E. Malling*

virus diseases—incidence, transmission, symptoms and spread; indexing trials: *Long Ashton*

see also under Apple, Cherry, Pear and Plum

Frost Damage

laboratory tests of varietal resistance to low temperature; factors affecting damage; effects of growth-regulating substances on recovery and set of damaged flowers; histological studies of frost damage: *E. Malling*

field studies of varietal resistance; blossom development in relation to resistance; cultural and other factors affecting damage; control by water-sprinkling; micro-climatological studies: *E. Malling*

Nutrition

mineral nutrition—analytical methods for study; culture methods for controlling nutrition; uptake, distribution and utilization of mineral elements in relation to growth and cropping: *E. Malling*

field investigations of manurial requirements under various soil management systems: *E. Malling*

effects of cover crops and fertilizers on tree growth, yield, and leaf nutrient status—long-term experiments at *Exp. Hort. Stns.* in collaboration with *N.A.A.S.*: *Long Ashton*

effect of iron chelates on lime-induced chlorosis: *Long Ashton*

absorption and movement of nutrients applied as foliage sprays: *Long Ashton*

comparison of different manurial programmes including organic and mineral fertilizers: *N.A.A.S., South Eastern Province*

control of iron deficiency by chelating compounds: *N.A.A.S., South Eastern Province*

Pests

aphids associated with top fruits—systematic and biological studies: *E. Malling*

eelworms—incidence, aetiology and importance of root lesion nematodes on top fruit: *E. Malling*

leaf hoppers—biological studies to obtain information about possible virus vectors: *E. Malling*

Tortricid moths—life cycle of the Summer Fruit Tortricid and other Tortricid moths: *E. Malling*

fruit pests generally—effects of crop variety and cultural practices on degree of attack (*see also* Spraying): *Long Ashton*

control of top fruit pests without winter ovicides: *N.A.A.S., South Eastern Province*

control of pests and scab by small-volume insecticides plus 100% lime-sulphur: *N.A.A.S., South Eastern Province*

tests of various repellents as sprays, greases and solids, against bird attacks on fruit buds: *N.A.A.S., South Eastern Province* (in co-operation with *M.A.F.F. Infest. Control*)

Physiology

see appropriate headings under Plant Physiology *in* Subject Index, *especially* Growth, *page* 19; Growth-regulating Substances, *page* 19; Physiological Disorders, *page* 23

Propagation

cuttings and layers—improvement of methods in relation to varietal differences; mist culture methods: *E. Malling*

grafting and budding—methods of avoiding incompatibility: *E. Malling*

physiological factors influencing rooting of cuttings and subsequent growth; growth-regulating substances in relation to rooting (at *E. Malling*): *Res. Inst. Pl. Phys.*

Rootstocks

rootstock/scion relations and rootstock trials; anatomy, breeding and propagation; collection and classification of new rootstock varieties for particular needs: *E. Malling*

rootstock/scion relations—physiological aspects of incompatibility; rootstock trials; latent virus infection in rootstocks: *Long Ashton*

Root Studies

root growth in relation to soil conditions; interaction of cover crops and fruit tree roots; effects of high soil temperatures on apple rootstocks: *E. Malling*

Soil Management in Orchards

type and vigour of swards and other cover crops; mulches; cultivation; effects of management on physical and chemical conditions of the soil: *E. Malling*

restoration of uniformity in old orchard land in preparation for new experimental plantings: *E. Malling*

effects of cover crops on mobilization and redistribution of plant nutrients in soils: *Long Ashton*

performance of various grass mixtures in orchards: *N.A.A.S., Eastern and South Eastern Provinces*

Spraying

modified methods of fungicide application; atomized concentrates: *E. Malling*

methods of application of plant protective materials; systems of orchard planting in relation to spraying methods; application in relation to host plant characters: *Long Ashton*

formation of sprays and their behaviour in air streams and in open-air conditions; co-operation with *E. Malling* and *Long Ashton* on spraying problems: *N.I.A.E.*

spray damage—physiological studies of injury by spray materials: *Res. Inst. Pl. Phys. and E. Malling*

Weed Control

weedkillers for control of weeds round the bases of trees: *E. Malling*

TURNIP

survey of virus diseases in turnip crops: *N. Scot. Coll.*

VEGETABLES

see also Asparagus, Beans, Beet (red), Brassicae, Carrot, Lettuce, Onion, Parsnip, Peas, Potato

Breeding and Genetics

breeding methods—effects of inbreeding and subsequent combination of inbred lines; effect of different levels of selection on variation in subsequent generations; causes of deterioration of varieties: *N.V.R.S.*

specific crops—*see* Asparagus, Beet (red), Brussels sprouts, Cabbage, Cauliflower, Lettuce, Onion, Radish: *N.V.R.S.*

development of varieties particularly suited to the Scottish climate and Scottish markets: *Scot. Hort. R.I.*

Cultural Methods

long-term effects of various mechanical cultivations on crop yield and soil texture: *Exptl. Hort. Stns., Efford, Luddington, Rosewarne, Stockbridge House*

spacing, planting dates, etc.—miscellaneous short-term trials: *N.A.A.S., Provincial Centres*

mechanical cultivation—the horticultural requirements of a tractor; compaction of seed beds by tractor wheels; comparison of tillage methods: *N.I.A.E.* (in collaboration with *Exptl. Hort. Stns.*)

Irrigation

effects of different soil moisture regimes on growth, yield and quality of a range of horticultural crops: *Exptl. Hort. Stns., Luddington, Stockbridge House* (in collaboration with *N.V.R.S.*)

irrigation machinery; preparation of irrigation experiments at *Exptl. Hort. Stns.*: *N.I.A.E.*

effects of different irrigation treatments on germination, establishment after transplanting, growth, yield and quality of vegetable crops; inter-relationship between these effects and soil moisture, soil temperature, and other environmental factors; use of meteorological data in regulating irrigation treatments; effect of irrigation on the nutrient status of the soil; organic matter content of soils in relation to stability of the surface soil under irrigation by spraylines: *N.V.R.S.*

Manuring

long-term comparison of bulky organic manures, used on a rotation of vegetables: *Exptl. Hort. Stns., Efford, Luddington, Rosewarne, Stockbridge House*

long-term effects of inorganic fertilizers used on a rotation of vegetables: *Exptl. Hort. Stns., Efford, Luddington, Rosewarne*

effect of various manurial treatments on a range of market-garden crops: *Exptl. Hort. Stn., Stockbridge House*

types and times of application of nitrogenous manures (long-term rotation experiment, begun 1954): *N.V.R.S.*

cultivation and manuring systems (long-term rotation experiment, begun 1954): *N.V.R.S.*

inorganic fertilizers, with and without dung (long-term factorial experiment with rotation of vegetable crops, begun 1954): *N.V.R.S.*

Pests

effects of insecticides applied to soil on growth and flavour of subsequent vegetable crops: *Exptl. Hort. Stns., Efford, Luddington, Stockbridge House*

residual effects of soil insecticides on soil fauna and on crop yield and quality: development of a laboratory method for bioassay of insecticides in soil; tasting tests for taint: *N.V.R.S.*

seed dressings for control of insect pests on various vegetables: *W. Scot. Coll.*

Variety Trials

trials at *N.I.A.B.* Regional Trial Centres and also in collaboration with *N.A.A.S.* (at *Exptl. Hort. Stns.* and other centres) and with *N.V.R.S.* and *Scot. Hort. R.I.*

trials of standard and new varieties: *N. Scot. Coll.*

trials with various vegetables for suitability of varieties under local Scottish conditions: *Scot. Hort. R.I.*

trials in co-operation with *Scot. Hort. R.I.* and *N.I.A.B.*: *W. Scot. Coll.*

Washing

methods of reducing effective water usage; collaboration with *D.S.I.R.* in studies of deterioration of washed vegetables: *N.I.A.E.*

prevention or control of deterioration following the washing of vegetables: *N.V.R.S.*

Weeds

various short-term experiments and observation studies: *N.A.A.S., Provincial Centres*

ecological study of weeds of vegetable crops; seed production and viability, rate of growth, length of life cycle and long-term effects of cultural practices on the viable weed-seed population of the soil; detailed study of factors affecting germination and seedling establishment in the field: *N.V.R.S.*

effects of weeds on growth, yield and quality of vegetable crops; short-term effects of cultivations on weed populations; competition between crops and weeds in the field; competition between selected weeds and crops under controlled conditions: *N.V.R.S.*

selective chemical methods of control; field study of promising chemicals; glasshouse testing of new chemicals: *N.V.R.S.*

WALNUT

description, propagation and testing of selected varieties: *E. Malling*

WATERCRESS

crook root disease—relation between nutrition and disease incidence; possible methods of field control; tests of varieties for resistance: *N.V.R.S.*

virus diseases—symptom types in the field; modes of spread; effects of viruses in association with crook root: *N.V.R.S.*

WHEAT

see also Cereals

Breeding and Genetics

winter wheat—breeding of improved strong-strawed high-yielding types with resistance to yellow rust and loose smut, and with suitable grain quality for specific purposes; investigation of the possibility of transferring a high degree of resistance to important diseases by wide crossing; development of techniques for small-scale milling and grain quality tests of hybrid material; hybrid vigour in inter-varietal crosses and yield behaviour in segregating populations: *Pl. Br. Inst.*

spring wheat—breeding of improved types having high yield, strong straw, and early maturity, and selected also on grain quality and resistance to yellow rust, brown rust and mildew; investigation of inheritance of yield characters, including effects of selection for grain size in hybrid populations and the contribution to yield of individual characters; use of backcrossing in the breeding of spring wheats from crosses between spring and winter varieties; observation and testing of useful mutants obtained by grain irradiation: *Pl. Br. Inst.*

genetical, cytological and pathological studies of inter-specific and intergeneric hybrids in Triticinae: *Pl. Br. Inst.*

breeding of spring wheat for high rainfall conditions: *Welsh P.B.S.*

Diseases

control of eyespot: *Exptl. Husb. Farm, Boxworth*

ergot—host range and varietal susceptibility: *N.I.A.B.*

loose smut—reaction of wheat varieties to various physiologic races: *N.I.A.B.*

yellow rust—identification of physiologic races and tests of new varieties of wheat for susceptibility: *N.I.A.B.*

yellow rust—varietal reactions: *N. Ireland*

yellow rust—relationship between seedling and mature plant resistance of wheat varieties; technique for the ready assessment of mature plant resistance: *Pl. Br. Inst.*

glasshouse tests of the rust and mildew reactions of wheat in the Institute's collection; isolation and identification of races of yellow rust, brown rust and mildew found on the Institute's trial grounds: *Pl. Br. Inst.*

observations on the reaction to rusts, mildew, bunt and smut of artificial amphidiploids in the Triticinae; mechanism of resistance of species of *Triticum* and *Aegilops* to rust and mildew: *Pl. Br. Inst.*

foot-rots—effects of varying seed rates, fertilizers and rotation on the yields of wheat on light and heavy land in relation to incidence of foot-rots; the reaction of different wheats to take-all: *Rothamsted*

mildew—control of mildew in wheat by fungicides to assess loss it causes: *Rothamsted*

Harvesting and Storage

see Cereals

Husbandry

various short-term experiments comparing seed rates, sowing times and other husbandry factors: *Exptl. Husb. Farms*

various experiments on husbandry factors: *N.A.A.S., Provincial Centres*

Manuring

performance of different varieties at various levels of manuring: *Exptl. Husb. Farms*

rates and times of top dressing with nitrogen; various other manurial experiments; trials with trace elements: *N.A.A.S., Provincial Centres*

varietal reactions to nitrogen: *N.I.A.B.*

long-term manurial experiments with wheat in rotations: *Rothamsted*

observations on plots at *Woburn* cropped continuously with wheat since 1877: *Rothamsted*

Pests

incidence and control of wheat bulb fly: *N.A.A.S., Eastern Province* (R.G.) (in collaboration with *Rothamsted*)

blossom midges—damage assessment: *Pl. Path. Lab. and N.A.A.S., Northern Province*

blossom midges—long-term study on Broadbalk: *Rothamsted*

bulb fly—biological studies; larval movements and infestation; adult behaviour and physiology; host-plant range and preferences; use of insecticides in control: *Rothamsted*

Physiology

physiology of premature sprouting and delayed germination: *N.I.A.B.*

Variety Studies

identification and description of varieties; field trials (*see* Cereals): *N.I.A.B.*

Weed Control

see Cereals

WILLOW

collection and study of basket and cricket-bat willows; survey of the botanical characters of basket-willow varieties; chemical control of weeds in willow beds: *Long Ashton*

rooting habits of basket willows in relation to mechanical cultivation: *Long Ashton*

pests of basket willows—methods of spray application; factors involved in insect attack; control of 'button top' midge: *Long Ashton*

influence of set treatment on the quality of cricket-bat timber: *Long Ashton*

APPENDIX

AGRICULTURAL RESEARCH INSTITUTES WHICH PUBLISH ANNUAL REPORTS

Agricultural and Horticultural Research Station, Long Ashton, Bristol

Animal Diseases Research Association, Moredun Institute, Edinburgh 9

East Malling Research Station, East Malling, Maidstone, Kent

Glasshouse Crops Research Institute, Worthing Road, Rustington, Littlehampton, Sussex

Grassland Research Station, Hurley, Maidenhead, Berks.

John Innes Horticultural Institution, Bayfordbury, Hertford

Macaulay Institute for Soil Research, Craigiebuckler, Aberdeen

National Institute for Research in Dairying, Shinfield, Reading, Berks.

National Institute of Agricultural Engineering, Wrest Park, Silsoe, Beds.

National Vegetable Research Station, Wellesbourne, Warwick

Rothamsted Experimental Station, Harpenden, Herts.

Scottish Horticultural Research Institute, Mylnefield, Invergowrie, Dundee

Scottish Society for Research in Plant Breeding, Pentlandfield, Roslin, Midlothian

---

Hannah Dairy Research Institute, Kirkhill, Ayr (triennial)

Hill Farming Research Organization, 48 Palmerston Place, Edinburgh 12 (triennial)

Houghton Poultry Research Station, Houghton, Hunts. (included in the Animal Health Trust Annual Report)

Research Institute (Animal Virus Diseases), Pirbright, Surrey (not published annually)

The Plant Pathology Laboratory of the Ministry of Agriculture, Fisheries and Food, Harpenden, Herts., publishes the quarterly journal *Plant Pathology*

The Soil Survey Research Board publishes annual reports of the Soil Survey of Great Britain

OTHER PUBLICATIONS OF THE AGRICULTURAL RESEARCH COUNCIL

The companion booklet to this Index, *The Agricultural Research Service*, is under revision and the new edition will be published shortly. Recent publications of the Council include, *Investigation of Virus Diseases of Brassica Crops*, by Dr L. Broadbent and a revised edition of *The Diagnosis of Mineral Deficiencies in Plants by Visual Symptoms*, by Professor T. Wallace. A list of publications still in print is obtainable from the Agricultural Research Council, Cunard Building, 15 Regent Street, London, S.W. 1.

CAMBRIDGE UNIVERSITY PRESS
Bentley House, 200 Euston Road, London, N.W. 1
American Branch: 32 East 57th Street, New York 22, N.Y.